BANGALORE WATER SUPPLY
AND SEWERAGE BOARD
CAUVERY BHAVAN, KEMPEGOWDA ROAD
BANGALORE - 560 009

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Through Karnataka Public Procurement Portal

KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP)

TENDER FOR THE WORK OF

PROCUREMENT AND CONSTRUCTION OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATED) IN 110 VILLAGE AREAS (Phase II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) – (Contract Package No. BWSSB CE-P/KWSDRP/WBS-II-B)

VOLUME 4 of 4

(DRAWINGS)

APRIL – 2025

Office of the *Chief Engineer (Project)*
BANGALORE WATER SUPPLY & SEWERAGE BOARD
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Bangalore -560 009
www.kppp.karnataka.gov.in

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VOLUME-4

WBS-2B

DRAWINGS

List of Drawings of WBS-2B		
Sl. No.	**Drawing No:**	**List of drawings**
1	TN-KWSDRP-WBS2B-CV-3026	RCC Precast Sewer Machine hole details - 1200 mm dia. (Typical) for depth upto 3.0 M
2	TN-KWSDRP-WBS2B-CV-3027	RCC Precast Sewer Machine hole details - 1500 mm dia. (Typical) for depth upto 3.0 M
3	TN-KWSDRP-WBS2B-CV-3028	RCC Precast Sewer Machine hole details - 1500 mm dia. (Typical) for depth upto 7.0 M
4	TN-KWSDRP-WBS2B-CV-3029	RCC Precast Sewer Machine hole details - 1800 mm dia. (Typical) for depth upto 3.0 M
5	TN-KWSDRP-WBS2B-CV-3030	RCC Precast Sewer Machine hole details - 1800 mm dia. (Typical) for depth upto 6.0 M
6	TN-KWSDRP-WBS2B-CV-3031	RCC Precast Sewer Machine hole details - 1800 mm dia. (Typical) for depth up to 8.0 M
7	TN-KWSDRP-WBS2B-CV-3032	RCC Precast Sewer Machine hole details - 1800 mm dia. (Typical) for depth up to 10.0 M
8	TN-KWSDRP-WBS2B-CV-3033	Standard Details of RCC Cast In-situ Machine hole - 1200mm, 1500mm and 1800 mm dia. Up to 3.0 m and 1500 mm , 1800 mm dia. Up to 6m depth (Typical)
9	TN-KWSDRP-WBS2B-CV-3034	RCC Cast In-situ machine hole - 1200mm, 1500mm and 1800 mm dia. Up to 3.0 M to 6 M depth (Typical)
10	TN-KWSDRP-WBS2B-CV-3035	RCC Precast Sewer Machine hole details for 1200, 1500 & 1800 mm dia. (Vertical wall)
11	TN-KWSDRP-WBS2B-CV-3036	Standard Details of RCC Cast In-situ Machine hole 1200 mm, 1500mm, 1800mm Dia. Upto 3 m depth. 1500mm, 1800mm upto 6 M depth (Typical) with Ventilation Shaft
12	TN-KWSDRP-WBS2B-CV-3037	Plan & Section of Brick Masonary Machine hole for 1.2m dia., 2 M & 6 M Depth
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14	TN-KWSDRP-WBS2B-CV-3039	Typical Drawing of Pipe Bedding/Encasing
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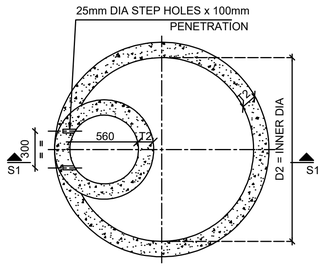
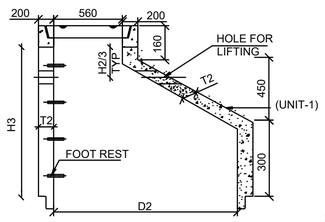
TITLE:	RCC PRECAST SEWER MACHINE HOLE DETAILS 1200MM DIA (TYPICAL) FOR DEPTH UPTO 3.0M
DWG NO:	TN-KWSDRP-WBS2B-CV-3026



1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



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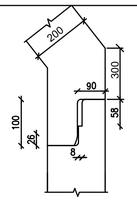
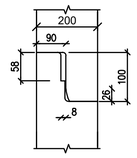
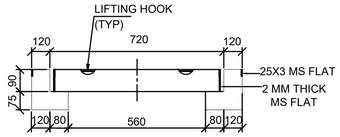


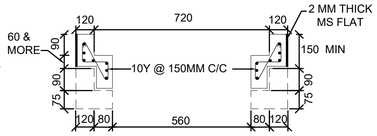
DETAIL OF 'Y'
TYP.JOINING DETAILS OF 1200 DIA PRECAST SEGMENT



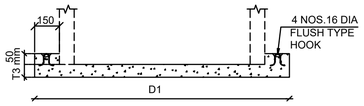
DETAILS OF 'Z'
TYP.JOINING DETAILS OF 1200 DIA PRECAST SEGMENT



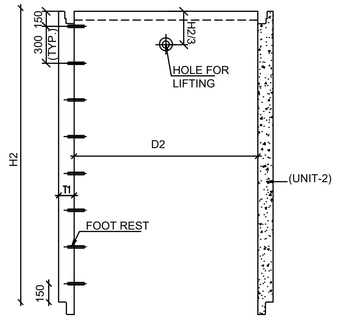
DETAIL OF 'X'
HD-20 MACHINE HOLE COVER



ADDITIONAL MACHINE HOLE HEIGHT TO MATCH FINISHED ROAD LEVEL



DETAILS OF BASE SLAB



4 DETAIL OF SEGMENT - H2(UNIT-2)
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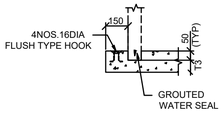
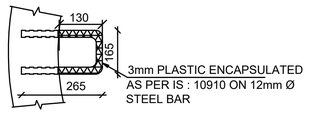


DETAIL OF 'U'



TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS

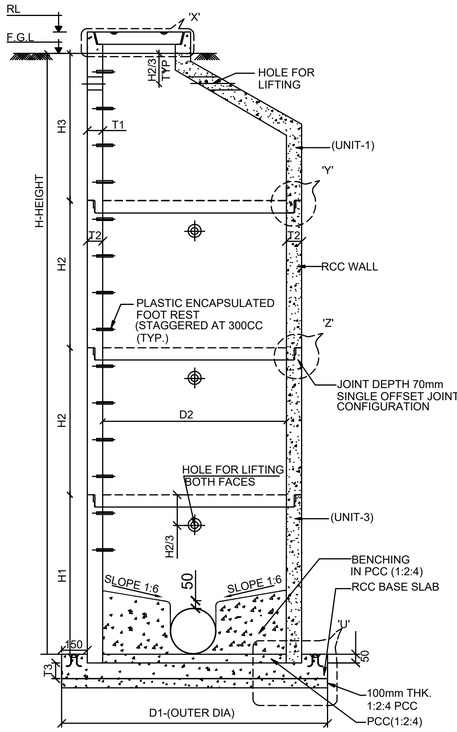
STANDARD DATA FOR PRECAST MACHINE HOLE								
1	**BASE SECTION**							PROVISION
a)	SIZE(DIAMETER) IN mm							1200
b)	DIA WISE DIMENSIONS							
	INNER DIA.OF BASE(D2) (mm)	WALL THK.(T1) (mm)	WALL THK.(T2) (mm)	JOINT DEPTH (mm)	BASE THK.(T3) (mm)	OUTER DIA.OF BASE(D1) (mm)	HEIGHT	
	1200	200	200	50	200	1900	UPTO 3m	
c)	AVAILABLE HEIGHT FOR BASE IN MM(H1)							300 TO 700 OR AS REQUIRED
d)	HOLES FOR SEWER CONNECTIONS							100mmØ MORE THAN OUTER Ø OF SEWER
e)	A)MAT CONCRETE THICKNESS IN MM & MIX							100mmTHICK,1:2:4 MIX
	B)CONCRETE MIX FOR WALL AND BASE							RCC M30 GRADE
f)	CONCRETE FILL FOR BENCHING							1:2:4, MIX WITH 1:6 SLOPE
g)	REINFORCEMENT							
	a)FOR BASE SLAB							AS PER RC DETAIL
	b)FOR WALL							AS PER RC DETAIL
2	**RISER SECTION**							
a)	AVAILABLE HEIGHT FOR RISER SECTION (H2)							300 TO 900 OR AS REQUIRED
b)	WALL THICKNESS IN MM							200mm
c)	JOINT THICKNESS AND JOINT MATERIAL							SAME AS BASE SECTION
d)	REINFORCEMENT IN THE WALL							AS PER DETAIL DRG.
3	**ECCENTRIC CONE SECTION**							
a)	SHAPE							ECCENTRIC CONE
b)	CONCRETE FILL AROUND SEWER							1:1.5:3MIX
c)	THICKNESS(T2)							200mm
d)	REINFORCEMENT							AS PER DETAIL DRG.
e)	TOP OPENING							560mm
f)	JOINT DEPTH							AS PER DETAIL DRG.
4	**STANDARD MACHINE HOLE FRAME AND COVER**							AS PER IS 12592-2002
a)	SHAPE							FLAT
b)	COVER SIZE							560mm
c)	SPECIFICATION							HD-20

NOTE:

1. ALL DIMENTIONS ARE IN mm AND ALL LEVELS ARE IN METER.
2. THE LIFTING HOLES SHALL BE FILLED WITH CONCRETE 1:1.5:3 MIX.
3. 3mm PVC ENCAPSULATE ON 12mm BAR, FOOT STEPS Fe 500.
4. THE NON CORE OPENING SHALL BE 100mm GREATER THAN THE OUTER DIA OF SEWER
5. SINGLE OFFSET JOINT CONFIGURATION SHALL BE ADOPTED AT THE JOINT.
6. THE JOINT SHALL BE SEALED WITH NON SHRINK GROUT/SINGLE RUBBER SEAL SHALL BE PROVIDED IN PRECAST UNITS.RUBBER GASKET SHALL BE AS PER IS 5382.
7. 150mm LIP IS OPTIONAL UNLESS OTHERWISE NOTED.
8. GRADE OF CONCRETE SHALL BE RCC M30 MIX FOR MANHOLE WALL AND FOR BASE SLAB WITH SULPHATE RESISTANCE CEMENT.
9. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFORMING TO IS:1786.
10. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE:
    a)WALL SOIL SEWAGE FACE=50mm
    b)BASE SLAB =50mm
11. THIS DRAWING IS ONLY TYPICAL CONSTRUCTION DRAWING. THE CONTRACTOR HAS TO TAKE PRIOR APPROVAL TO THE PROCESS OF MANUFACTURE OF THE PRECAST MANHOLE.
12. NET SAFE BEARING CAPACITY IS ASSUMED TO BE 10 TON/Sq.m. IF LOWER SBC ENCOUNTERED, THE BASE SLAB THICKNESS SHALL BE INCREASED AS PER DIRECTION OF ENGINEER.
13. PRE CAST FRAME AND COVER AS PER IS:12592-2002.
14. LOWEST FOOT REST SHALL NOT BE MORE THAN 300mm ABOVE BENCHING.
15. FOR MINIMUM DEPTH-MANHOLES(1.25m), WHEREVER OCCURS,THE CONICAL SECTION AND THE RISER SEGMENT (H1) MAY BE CAST AS A SINGLE UNIT BASED ON THE SITE CONDITIONS.
16. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED
17. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
18. INCASE OF HIGHER DIAMETER PIPES, PROVISION FOR THE INCOMING AND OUTGOING SEWERS MAY BE PROVIDED IN TWO PRECAST MEMEBERS OR HEIGHT OF THE BOTTOM PRECAST MEMBERS MAY BE INCREASED
19. ADDITION REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
20. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
21. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.

LEGEND:

FGL	-FINISHED GROUND LEVEL
RL	-ROAD LEVEL
LVL	-LEVEL
THK.	THICKNESS
TYP.	-TYPICAL
BW	-BOTH WAYS
BF	-BOTH FACES
REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL



2 SECTION S1-S1
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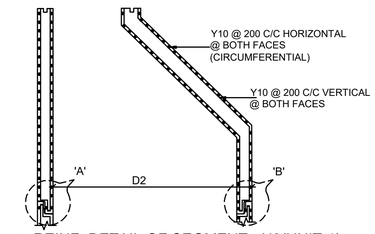
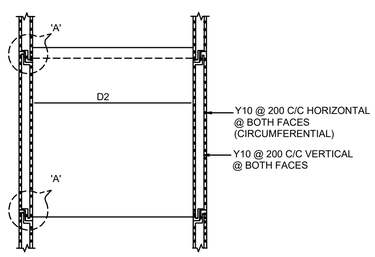


5 REINF. DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS



6 REINF. DETAIL OF SEGMENT - H2(UNIT-2)
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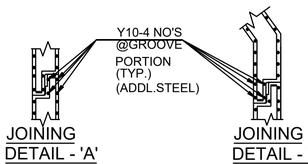
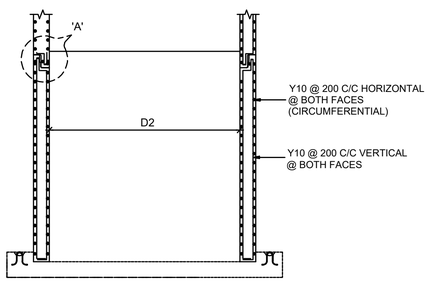


JOINING DETAIL - 'A'

JOINING DETAIL - 'B'



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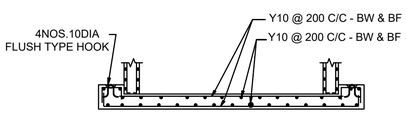


8 REINF. DETAIL OF BASE SLAB
SCALE : NTS

ISSUE	DATE	DESCRIPTION	BY	CHECKED	APPD.
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	- -

FOR TENDER PURPOSE ONLY

BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

TITLE:

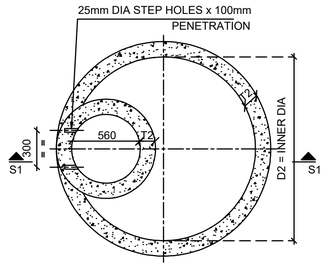
RCC PRECAST SEWER MACHINE HOLE DETAILS 1200mm DIA (TYPICAL) FOR DEPTH UPTO 3.0M

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

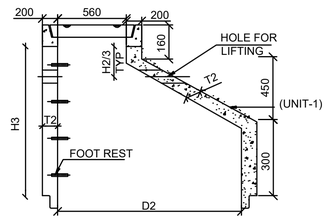
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE: (CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3026	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3026.dwg		A1 SIZE

TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1500MM DIA (TYPICAL) FOR DEPTH UPTO 3.0M

DWG NO: TN-KWSDRP-WBS2B-CV-3027



1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



3 DETAIL OF SEGMENT - H3(UNIT-1)
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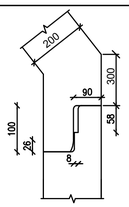
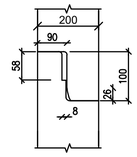


DETAIL OF 'Y'
TYP.JOINING DETAILS OF 1500 DIA PRECAST SEGMENT



DETAILS OF 'Z'
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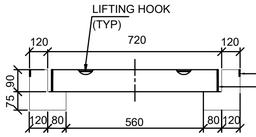
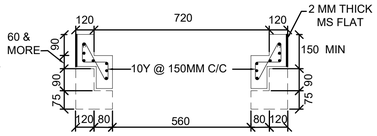
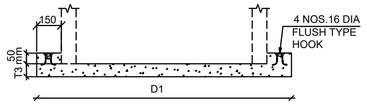


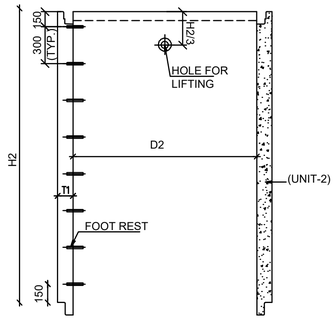
DETAIL OF 'X'
HD-20 MACHINE HOLE COVER



ADDITIONAL MACHINE HOLE HEIGHT TO MATCH FINISHED ROAD LEVEL



DETAILS OF BASE SLAB



4 DETAIL OF SEGMENT - H2(UNIT-2)
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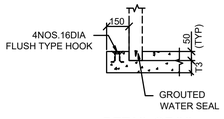
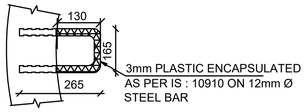
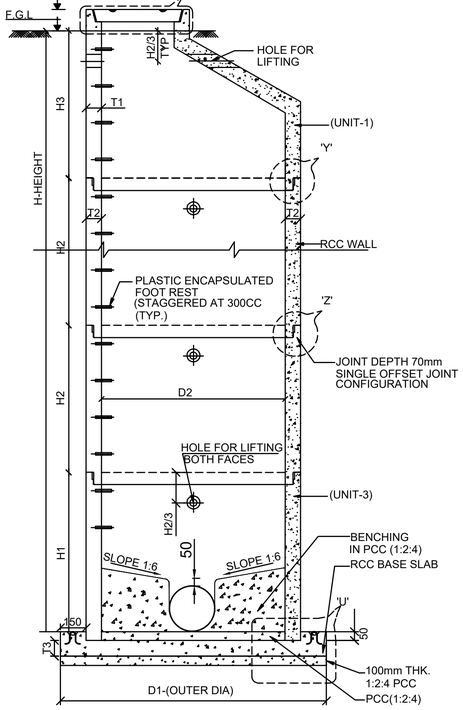


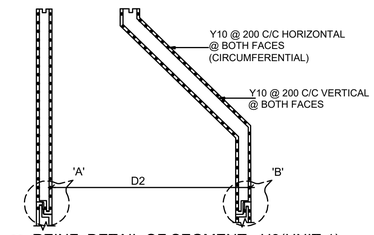
DETAIL OF 'U'



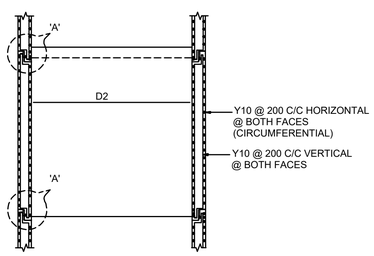
TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS



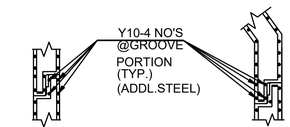
2 SECTION S1-S1
SCALE : NTS



5 REINF. DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS

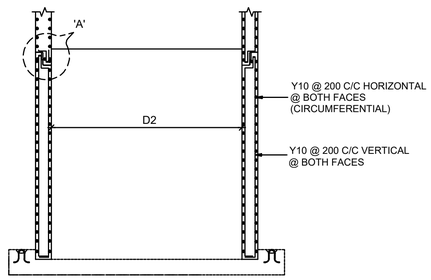


6 REINF. DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS

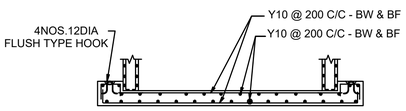


JOINING DETAIL - 'A'

JOINING DETAIL - 'B'



7 REINF. DETAIL OF SEGMENT - H1(UNIT-3)
SCALE : NTS



8 REINF. DETAIL OF BASE SLAB
SCALE : NTS

STANDARD DATA FOR PRECAST MANHOLE								
1	**BASE SECTION**							PROVISION
a)	SIZE(DIAMETER) IN mm							1500
b)	DIA WISE DIMENSIONS							
	INNER DIA.OF BASE(D2) (mm)	WALL THK.(T1) (mm)	WALL THK.(T2) (mm)	JOINT DEPTH (mm)	BASE THK.(T3) (mm)	OUTER DIA.OF BASE(D1) (mm)	HEIGHT	
	1500	200	200	50	250	2200	UPTO 3m	
c)	AVAILABLE HEIGHT FOR BASE IN MM(H1)							300 TO 700 OR AS REQUIRED
d)	HOLES FOR SEWER CONNECTIONS							100mmØ MORE THAN OUTER Ø OF SEWER
e)	A)MAT CONCRETE THICKNESS IN MM & MIX							100mmTHICK,1:2:4 MIX
	B)CONCRETE MIX FOR WALL AND BASE							RCC M30 GRADE
f)	CONCRETE FILL FOR BENCHING							1:2:4, MIX WITH 1:6 SLOPE
g)	REINFORCEMENT							
	a)FOR BASE SLAB							AS PER RC DETAIL
	b)FOR WALL							AS PER RC DETAIL
2	**RISER SECTION**							
a)	AVAILABLE HEIGHT FOR RISER SECTION (H2)							300 TO 900 OR AS REQUIRED
b)	WALL THICKNESS IN MM							200mm
c)	JOINT THICKNESS AND JOINT MATERIAL							SAME AS BASE SECTION
d)	REINFORCEMENT IN THE WALL							AS PER DETAIL DRG.
3	**ECCENTRIC CONE SECTION**							
a)	SHAPE							ECCENTRIC CONE
b)	CONCRETE FILL AROUND SEWER							1:1.5:3MIX
c)	THICKNESS(T2)							200mm
d)	REINFORCEMENT							AS PER DETAIL DRG.
e)	TOP OPENING							560mm
f)	JOINT DEPTH							AS PER DETAIL DRG.
4	**STANDARD** MACHINE HOLE **FRAME AND COVER**							AS PER IS 12592-2002
a)	SHAPE							FLAT
b)	COVER SIZE							560mm
c)	SPECIFICATION							HD-20

NOTE:

1. ALL DIMENTIONS ARE IN mm AND ALL LEVELS ARE IN METER.
2. THE LIFTING HOLES SHALL BE FILLED WITH CONCRETE 1:1.5:3 MIX.
3. 3mm PVC ENCAPSULATE ON 12mm BAR, FOOT STEPS Fe 500.
4. THE NON CORE OPENING SHALL BE 100mm GREATER THAN THE OUTER DIA OF SEWER
5. SINGLE OFFSET JOINT CONFIGURATION SHALL BE ADOPTED AT THE JOINT.
6. THE JOINT SHALL BE SEALED WITH NON SHRINK GROUT/SINGLE RUBBER SEAL SHALL BE PROVIDED IN PRECAST UNITS.RUBBER GASKET SHALL BE AS PER IS 5382.
7. 150mm LIP IS OPTIONAL UNLESS OTHERWISE NOTED.
8. GRADE OF CONCRETE SHALL BE RCC M30 MIX FOR MANHOLE WALL AND FOR BASE SLAB WITH SULPHATE RESISTANCE CEMENT.
9. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFORMING TO IS:1786.
10. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE:
    a)WALL SOIL SEWAGE FACE=50mm
    b)BASE SLAB =50mm
11. THIS DRAWING IS ONLY TYPICAL CONSTRUCTION DRAWING. THE CONTRACTOR HAS TO TAKE PRIOR APPROVAL TO THE PROCESS OF MANUFACTURE OF THE PRECAST MANHOLE.
12. NET SAFE BEARING CAPACITY IS ASSUMED TO BE 10 TON/Sq.m. IF LOWER SBC ENCOUNTERED, THE BASE SLAB THICKNESS SHALL BE INCREASED AS PER DIRECTION OF ENGINEER.
13. PRE CAST FRAME AND COVER AS PER IS:12592-2002.
14. LOWEST FOOT REST SHALL NOT BE MORE THAN 300mm ABOVE BENCHING.
15. FOR MINIMUM DEPTH-MANHOLES(1.25m), WHEREVER OCCURS,THE CONICAL SECTION AND THE RISER SEGMENT (H1) MAY BE CAST AS A SINGLE UNIT BASED ON THE SITE CONDITIONS.
16. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED
17. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
18. INCASE OF HIGHER DIAMETER PIPES, PROVISION FOR THE INCOMING AND OUTGOING SEWERS MAY BE PROVIDED IN TWO PRECAST MEMEBERS OR HEIGHT OF THE BOTTOM PRECAST MEMBERS MAY BE INCREASED
19. ADDITION REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
20. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
21. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.

LEGEND:

FGL	FINISHED GROUND LEVEL
RL	REDUCED LEVEL
LVL	LEVEL
THK	THICKNESS
TYP	TYPICAL
BW	BOTH WAYS
BF	BOTH FACES
RF/REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL

ISSUE	DATE	DESCRIPTION	BY	CHECKED	APPD.
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	-	-	

FOR TENDER PURPOSE ONLY

BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

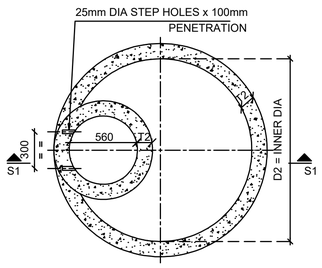
TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1500mm DIA (TYPICAL) FOR DEPTH UPTO 3.0M

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

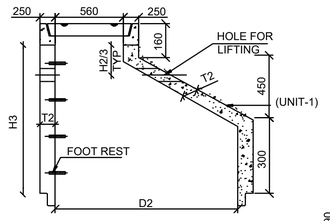
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE: (CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3027	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3027.dwg		A1 SIZE

TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1500MM DIA (TYPICAL) FOR DEPTH UPTO 7.0M

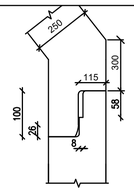
DWG NO: TN-KWSDRP-WBS2B-CV-3028



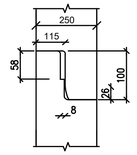
1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



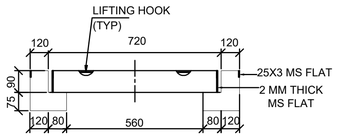
3 DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS



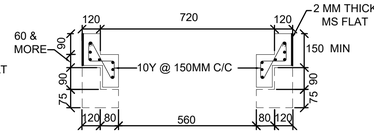
DETAIL OF 'Y'
TYP.JOINING DETAILS OF 1500 DIA PRECAST SEGMENT



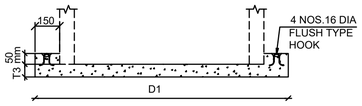
DETAILS OF 'Z'
TYP.JOINING DETAILS OF 1500 DIA PRECAST SEGMENT



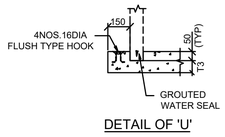
DETAIL OF 'X'
HD-20 MACHINE HOLE COVER



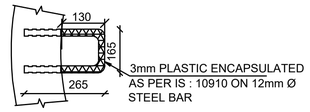
ADDITIONAL MACHINE HOLE HEIGHT TO MATCH FINISHED ROAD LEVEL



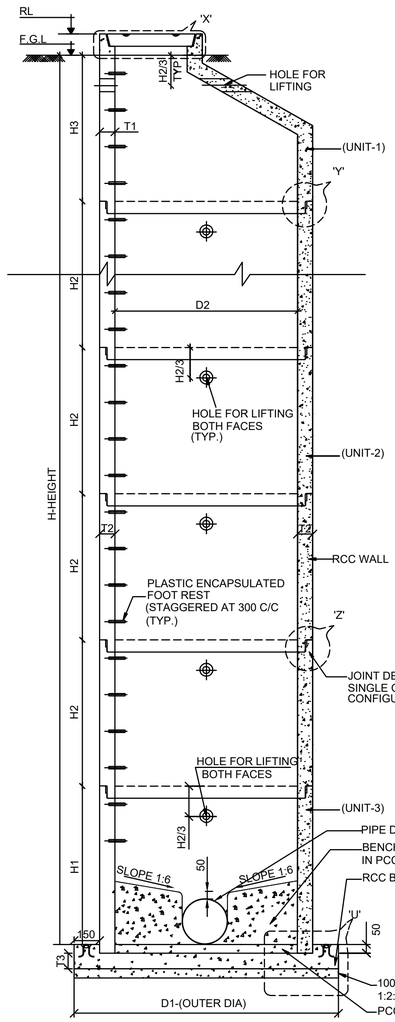
DETAILS OF BASE SLAB



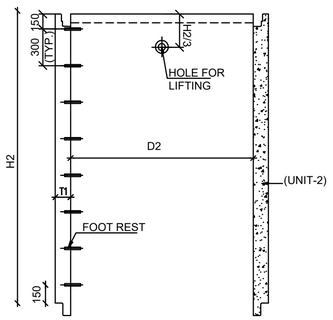
DETAIL OF 'U'



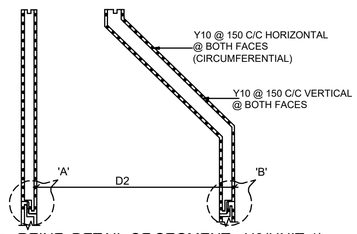
TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS



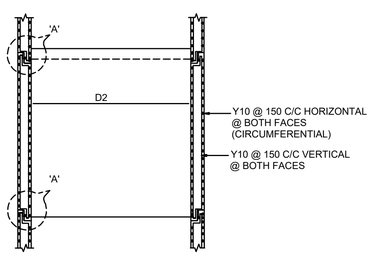
2 SECTION S1-S1
SCALE:NTS



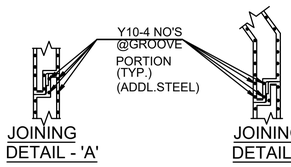
4 DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS



5 REINF. DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS

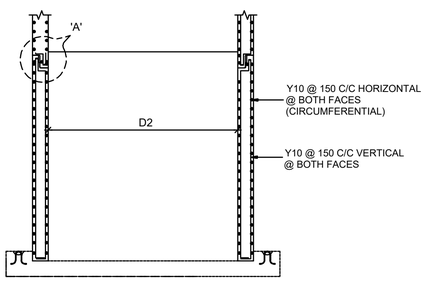


6 REINF. DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS

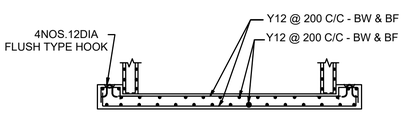


JOINING DETAIL - 'A'

JOINING DETAIL - 'B'



7 REINF. DETAIL OF SEGMENT - H1(UNIT-3)
SCALE : NTS



8 REINF. DETAIL OF BASE SLAB
SCALE : NTS

STANDARD DATA FOR PRECAST MACHINE HOLE								
1	**BASE SECTION**							PROVISION
a)	SIZE(DIAMETER) IN mm							1500
b)	DIA WISE DIMENSIONS							
	INNER DIA.OF BASE(D2) (mm)	WALL THK.(T1) (mm)	WALL THK.(T2) (mm)	JOINT DEPTH (mm)	BASE THK.(T3) (mm)	OUTER DIA.OF BASE(D1) (mm)	HEIGHT	
	1500	250	250	50	300	2300	UPTO 7m	
c)	AVAILABLE HEIGHT FOR BASE IN MM(H1)							300 TO 700 OR AS REQUIRED
d)	HOLES FOR SEWER CONNECTIONS							100mmØ MORE THAN OUTER Ø OF SEWER
e)	A)MAT CONCRETE THICKNESS IN MM & MIX							100mmTHICK,1:2:4 MIX
	B)CONCRETE MIX FOR WALL AND BASE							RCC M30 GRADE
f)	CONCRETE FILL FOR BENCHING							1:2:4, MIX WITH 1:6 SLOPE
g)	REINFORCEMENT							
	a)FOR BASE SLAB							AS PER RC DETAIL
	b)FOR WALL							AS PER RC DETAIL
2	**RISER SECTION**							
a)	AVAILABLE HEIGHT FOR RISER SECTION (H2)							300 TO 900 OR AS REQUIRED
b)	WALL THICKNESS IN MM							250mm
c)	JOINT THICKNESS AND JOINT MATERIAL							SAME AS BASE SECTION
d)	REINFORCEMENT IN THE WALL							AS PER DETAIL DRG.
3	**ECCENTRIC CONE SECTION**							
a)	SHAPE							ECCENTRIC CONE
b)	CONCRETE FILL AROUND SEWER							1:1.5:3MIX
c)	THICKNESS(T2)							250mm
d)	REINFORCEMENT							AS PER DETAIL DRG.
e)	TOP OPENING							560mm
f)	JOINT DEPTH							AS PER DETAIL DRG.
4	**STANDARD MACHINE HOLE FRAME AND COVER**							AS PER IS 12592-2002
a)	SHAPE							FLAT
b)	COVER SIZE							560mm
c)	SPECIFICATION							HD-20

NOTE:

1. ALL DIMENTIONS ARE IN mm AND ALL LEVELS ARE IN METER.
2. THE LIFTING HOLES SHALL BE FILLED WITH CONCRETE 1:1.5:3 MIX.
3. 3mm PVC ENCAPSULATE ON 12mm BAR, FOOT STEPS Fe 500.
4. THE NON CORE OPENING SHALL BE 100mm GREATER THAN THE OUTER DIA OF SEWER.
5. SINGLE OFFSET JOINT CONFIGURATION SHALL BE ADOPTED AT THE JOINT.
6. THE JOINT SHALL BE SEALED WITH NON SHRINK GROUT/SINGLE RUBBER SEAL SHALL BE PROVIDED IN PRECAST UNITS.RUBBER GASKET SHALL BE AS PER IS 5382.
7. 150mm LIP IS OPTIONAL UNLESS OTHERWISE NOTED.
8. GRADE OF CONCRETE SHALL BE RCC M30 MIX FOR MANHOLE WALL AND FOR BASE SLAB WITH SULPHATE RESISTANCE CEMENT.
9. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFORMING TO IS:1786.
10. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE:
    a)WALL SOIL SEWAGE FACE=50mm
    b)BASE SLAB =50mm
11. THIS DRAWING IS ONLY TYPICAL CONSTRUCTION DRAWING. THE CONTRACTOR HAS TO TAKE PRIOR APPROVAL TO THE PROCESS OF MANUFACTURE OF THE PRECAST MANHOLE.
12. NET SAFE BEARING CAPACITY IS ASSUMED TO BE 10 TON/Sq.m. IF LOWER SBC ENCOUNTERED, THE BASE SLAB THICKNESS SHALL BE INCREASED AS PER DIRECTION OF ENGINEER.
13. PRE CAST FRAME AND COVER AS PER IS:12592-2002.
14. LOWEST FOOT REST SHALL NOT BE MORE THAN 300mm ABOVE BENCHING.
15. FOR MINIMUM DEPTH-MANHOLES(1.25m), WHEREVER OCCURS,THE CONICAL SECTION AND THE RISER SEGMENT (H1) MAY BE CAST AS A SINGLE UNIT BASED ON THE SITE CONDITIONS.
16. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED
17. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
18. INCASE OF HIGHER DIAMETER PIPES, PROVISION FOR THE INCOMING AND OUTGOING SEWERS MAY BE PROVIDED IN TWO PRECAST MEMEBERS OR HEIGHT OF THE BOTTOM PRECAST MEMBERS MAY BE INCREASED
19. ADDITION REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
20. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
21. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.

LEGEND:

FGL	-FINISHED GROUND LEVEL
RL	-ROAD LEVEL
LVL	-LEVEL
THK.	THICKNESS
TYP.	-TYPICAL
BW	-BOTH WAYS
BF	-BOTH FACES
REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL

ISSUE	DATE	DESCRIPTION	BY	CHECKED	APPD.
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	- - - -

FOR TENDER PURPOSE ONLY

BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

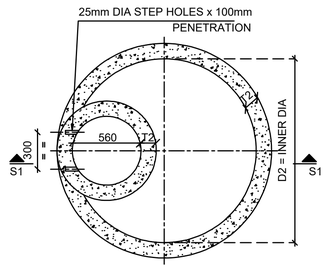
TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1500mm DIA (TYPICAL) FOR DEPTH UPTO 7.0M

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

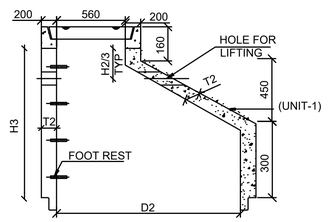
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE: (CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3028	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3028.dwg		A1 SIZE

TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1800MM DIA (TYPICAL) FOR DEPTH UPTO 3.0M

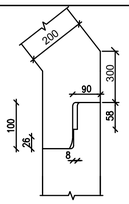
DWG NO: TN-KWSDRP-WBS2B-CV-3029



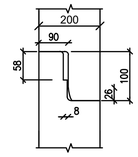
1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



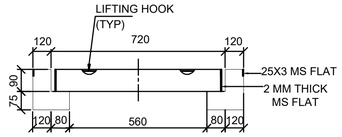
3 DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS



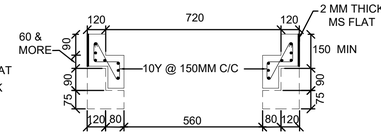
DETAIL OF 'Y'
TYP.JOINING DETAILS OF 1800 DIA PRECAST SEGMENT



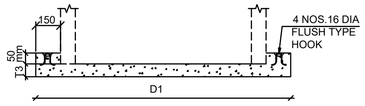
DETAILS OF 'Z'
TYP.JOINING DETAILS OF 1800 DIA PRECAST SEGMENT



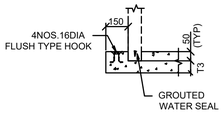
DETAIL OF 'X'
HD-20 MACHINE HOLE COVER



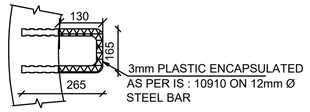
ADDITIONAL MACHINE HEIGHT TO MATCH FINISHED ROAD LEVEL



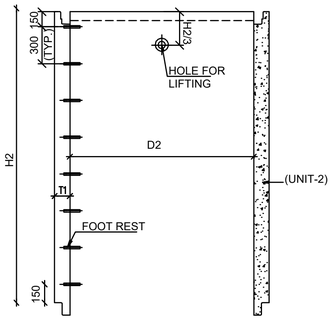
DETAILS OF BASE SLAB



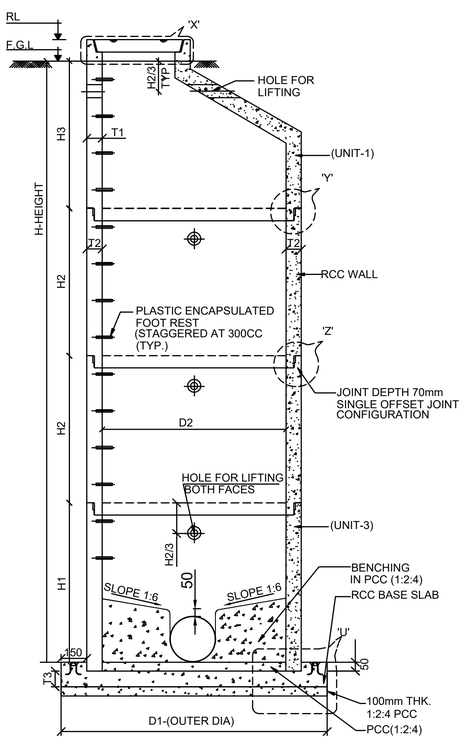
DETAIL OF 'U'



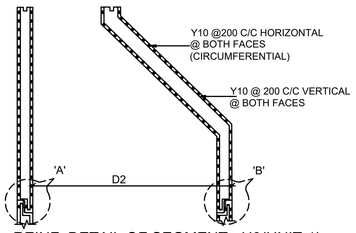
TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS



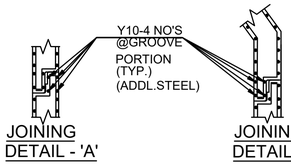
4 DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS



2 SECTION S1-S1
SCALE : NTS

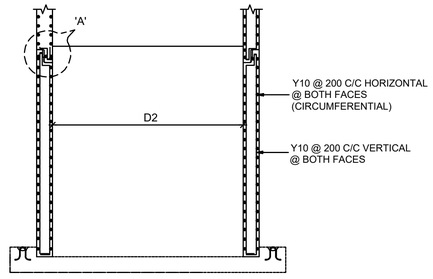


5 REINF. DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS

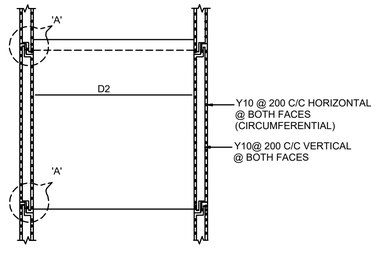


JOINING DETAIL - 'A'

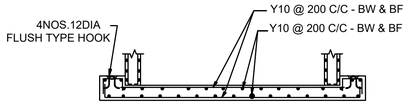
JOINING DETAIL - 'B'



7 REINF. DETAIL OF SEGMENT - H1(UNIT-3)
SCALE : NTS



6 REINF. DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS



8 REINF. DETAIL OF BASE SLAB
SCALE : NTS

STANDARD DATA FOR PRECAST MACHINE HOLE								
1	**BASE SECTION**							PROVISION
a)	SIZE(DIAMETER) IN mm							1800
b)	DIA WISE DIMENSIONS							
	INNER DIA.OF BASE(D2) (mm)	WALL THK.(T1) (mm)	WALL THK.(T2) (mm)	JOINT DEPTH (mm)	BASE THK.(T3) (mm)	OUTER DIA.OF BASE(D1) (mm)	HEIGHT	
	1800	200	200	50	250	2500	UPTO 3m	
c)	AVAILABLE HEIGHT FOR BASE IN MM(H1)							300 TO 700 OR AS REQUIRED
d)	HOLES FOR SEWER CONNECTIONS							100mmØ MORE THAN OUTER Ø OF SEWER
e)	A)MAT CONCRETE THICKNESS IN MM & MIX							100mmTHICK,1:2:4 MIX
	B)CONCRETE MIX FOR WALL AND BASE							RCC M30 GRADE
f)	CONCRETE FILL FOR BENCHING							1:2:4, MIX WITH 1:6 SLOPE
g)	REINFORCEMENT							
	a)FOR BASE SLAB							AS PER RC DETAIL
	b)FOR WALL							AS PER RC DETAIL
2	**RISER SECTION**							
a)	AVAILABLE HEIGHT FOR RISER SECTION (H2)							300 TO 900 OR AS REQUIRED
b)	WALL THICKNESS IN MM							200mm
c)	JOINT THICKNESS AND JOINT MATERIAL							SAME AS BASE SECTION
d)	REINFORCEMENT IN THE WALL							AS PER DETAIL DRG.
3	**ECCENTRIC CONE SECTION**							
a)	SHAPE							ECCENTRIC CONE
b)	CONCRETE FILL AROUND SEWER							1:1.5:3MIX
c)	THICKNESS(T2)							200mm
d)	REINFORCEMENT							AS PER DETAIL DRG.
e)	TOP OPENING							560mm
f)	JOINT DEPTH							AS PER DETAIL DRG.
4	**STANDARD** MACHINE HOLE **FRAME AND COVER**							AS PER IS 12592-2002
a)	SHAPE							FLAT
b)	COVER SIZE							560mm
c)	SPECIFICATION							HD-20

NOTE:

1. ALL DIMENTIONS ARE IN mm AND ALL LEVELS ARE IN METER.
2. THE LIFTING HOLES SHALL BE FILLED WITH CONCRETE 1:1.5:3 MIX.
3. 3mm PVC ENCAPSULATE ON 12mm BAR, FOOT STEPS Fe 500.
4. THE NON CORE OPENING SHALL BE 100mm GREATER THAN THE OUTER DIA OF SEWER
5. SINGLE OFFSET JOINT CONFIGURATION SHALL BE ADOPTED AT THE JOINT.
6. THE JOINT SHALL BE SEALED WITH NON SHRINK GROUT/SINGLE RUBBER SEAL SHALL BE PROVIDED IN PRECAST UNITS.RUBBER GASKET SHALL BE AS PER IS 5382.
7. 150mm LIP IS OPTIONAL UNLESS OTHERWISE NOTED.
8. GRADE OF CONCRETE SHALL BE RCC M30 MIX FOR MANHOLE WALL AND FOR BASE SLAB WITH SULPHATE RESISTANCE CEMENT.
9. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFORMING TO IS:1786.
10. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE:
    a)WALL SOIL SEWAGE FACE=50mm
    b)BASE SLAB =50mm
11. THIS DRAWING IS ONLY TYPICAL CONSTRUCTION DRAWING. THE CONTRACTOR HAS TO TAKE PRIOR APPROVAL TO THE PROCESS OF MANUFACTURE OF THE PRECAST MANHOLE.
12. NET SAFE BEARING CAPACITY IS ASSUMED TO BE 10 TON/Sq.m. IF LOWER SBC ENCOUNTERED, THE BASE SLAB THICKNESS SHALL BE INCREASED AS PER DIRECTION OF ENGINEER.
13. PRE CAST FRAME AND COVER AS PER IS:12592-2002.
14. LOWEST FOOT REST SHALL NOT BE MORE THAN 300mm ABOVE BENCHING.
15. FOR MINIMUM DEPTH-MANHOLES(1.25m), WHEREVER OCCURS,THE CONICAL SECTION AND THE RISER SEGMENT (H1) MAY BE CAST AS A SINGLE UNIT BASED ON THE SITE CONDITIONS.
16. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED
17. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
18. INCASE OF HIGHER DIAMETER PIPES, PROVISION FOR THE INCOMING AND OUTGOING SEWERS MAY BE PROVIDED IN TWO PRECAST MEMEBERS OR HEIGHT OF THE BOTTOM PRECAST MEMBERS MAY BE INCREASED
19. ADDITION REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
20. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
21. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.

LEGEND:

FGL	-FINISHED GROUND LEVEL
RL	-ROAD LEVEL
LVL	-LEVEL
THK	THICKNESS
TYP.	-TYPICAL
BW	-BOTH WAYS
BF	-BOTH FACES
REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL

ISSUE	DATE	DESCRIPTION	BY	CHECKED	APPD.
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	-
			CIVIL	-	-

FOR TENDER PURPOSE ONLY

BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

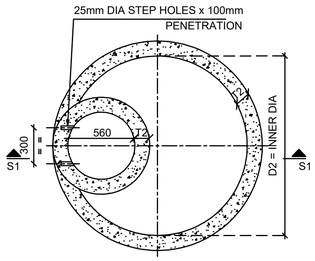
TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1800mm DIA (TYPICAL) FOR DEPTH UPTO 3.0M

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

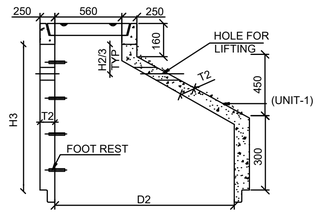
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE: (CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3029	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3029.dwg		A1 SIZE

TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1800MM DIA (TYPICAL) FOR DEPTH UPTO 6.0M

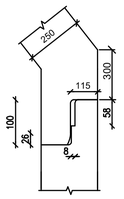
DWG NO: TN-KWSDRP-WBS2B-CV-3030



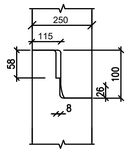
1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



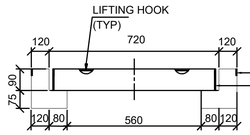
3 DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS



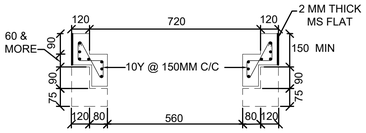
DETAIL OF 'Y'
TYP.JOINING DETAILS OF 1800 DIA PRECAST SEGMENT



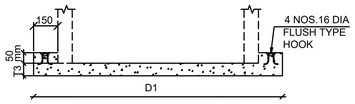
DETAILS OF 'Z'
TYP.JOINING DETAILS OF 1800 DIA PRECAST SEGMENT



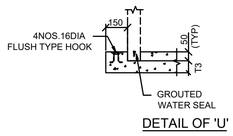
DETAIL OF 'X'
HD-20 MACHINE HOLE COVER



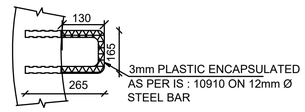
ADDITIONAL MACHINE HEIGHT TO MATCH FINISHED ROAD LEVEL



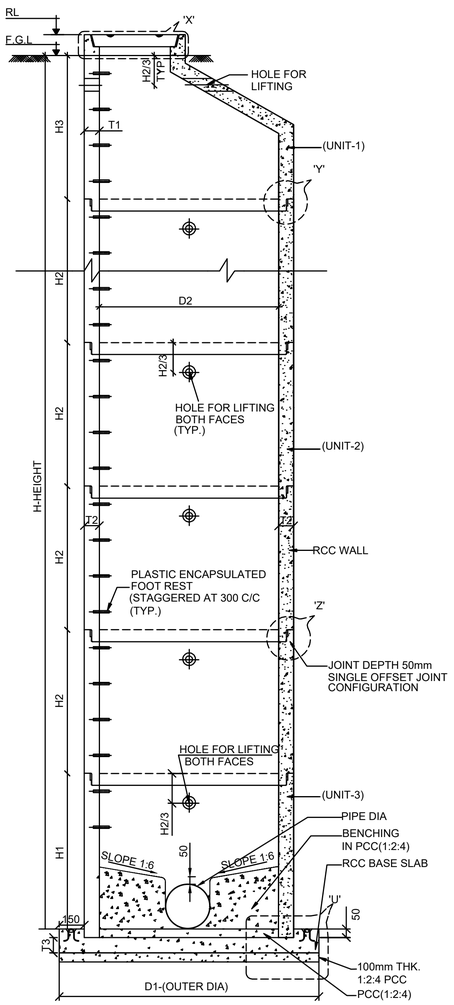
DETAILS OF BASE SLAB



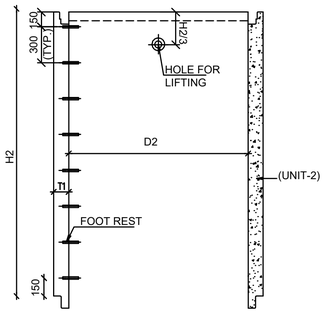
DETAIL OF 'U'



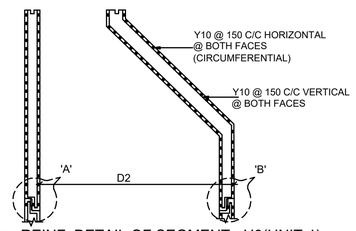
TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS



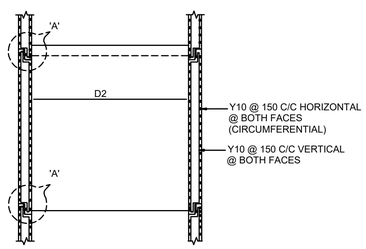
2 SECTION S1-S1
SCALE:NTS



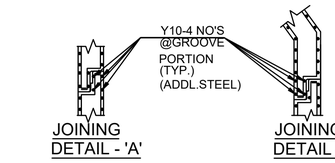
4 DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS



5 REINF. DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS

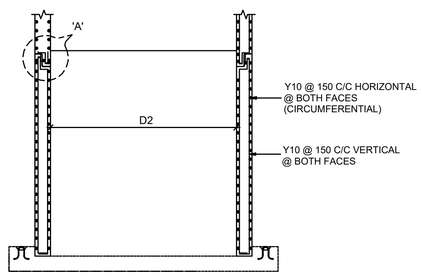


6 REINF. DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS

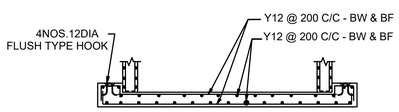


JOINING DETAIL - 'A'

JOINING DETAIL - 'B'



7 REINF. DETAIL OF SEGMENT - H1(UNIT-3)
SCALE : NTS



8 REINF. DETAIL OF BASE SLAB
SCALE : NTS

STANDARD DATA FOR PRECAST MACHINE HOLE								
1	**BASE SECTION**							PROVISION
a)	SIZE(DIAMETER) IN mm							1800
b)	DIA WISE DIMENSIONS							
	INNER DIA.OF BASE(D2) (mm)	WALL THK.(T1) (mm)	WALL THK.(T2) (mm)	JOINT DEPTH (mm)	BASE THK.(T3) (mm)	OUTER DIA.OF BASE(D1) (mm)	HEIGHT	
	1800	250	250	50	300	2600	UPTO 6m	
c)	AVAILABLE HEIGHT FOR BASE IN MM(H1)							300 TO 700 OR AS REQUIRED
d)	HOLES FOR SEWER CONNECTIONS							100mmØ MORE THAN OUTER Ø OF SEWER
e)	A)MAT CONCRETE THICKNESS IN MM & MIX							100mmTHICK,1:2:4 MIX
	B)CONCRETE MIX FOR WALL AND BASE							RCC M30 GRADE
f)	CONCRETE FILL FOR BENCHING							1:2:4, MIX WITH 1:6 SLOPE
g)	REINFORCEMENT							
	a)FOR BASE SLAB							AS PER RC DETAIL
	b)FOR WALL							AS PER RC DETAIL
2	**RISER SECTION**							
a)	AVAILABLE HEIGHT FOR RISER SECTION (H2)							300 TO 900 OR AS REQUIRED
b)	WALL THICKNESS IN MM							250mm
c)	JOINT THICKNESS AND JOINT MATERIAL							SAME AS BASE SECTION
d)	REINFORCEMENT IN THE WALL							AS PER DETAIL DRG.
3	**ECCENTRIC CONE SECTION**							
a)	SHAPE							ECCENTRIC CONE
b)	CONCRETE FILL AROUND SEWER							1:1.5:3MIX
c)	THICKNESS(T2)							250mm
d)	REINFORCEMENT							AS PER DETAIL DRG.
e)	TOP OPENING							560mm
f)	JOINT DEPTH							AS PER DETAIL DRG.
4	**STANDARD** MACHINE HOLE **FRAME AND COVER**							AS PER IS 12592-2002
a)	SHAPE							FLAT
b)	COVER SIZE							560mm
c)	SPECIFICATION							HD-20

NOTE:

1. ALL DIMENTIONS ARE IN mm AND ALL LEVELS ARE IN METER.
2. THE LIFTING HOLES SHALL BE FILLED WITH CONCRETE 1:1.5:3 MIX.
3. 3mm PVC ENCAPSULATE ON 12mm BAR, FOOT STEPS Fe 500.
4. THE NON CORE OPENING SHALL BE 100mm GREATER THAN THE OUTER DIA OF SEWER.
5. SINGLE OFFSET JOINT CONFIGURATION SHALL BE ADOPTED AT THE JOINT.
6. THE JOINT SHALL BE SEALED WITH NON SHRINK GROUT/SINGLE RUBBER SEAL SHALL BE PROVIDED IN PRECAST UNITS.RUBBER GASKET SHALL BE AS PER IS 5382.
7. 150mm LIP IS OPTIONAL UNLESS OTHERWISE NOTED.
8. GRADE OF CONCRETE SHALL BE RCC M30 MIX FOR MANHOLE WALL AND FOR BASE SLAB WITH SULPHATE RESISTANCE CEMENT.
9. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFORMING TO IS:1786.
10. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE:
    a)WALL SOIL SEWAGE FACE=50mm
    b)BASE SLAB =50mm
11. THIS DRAWING IS ONLY TYPICAL CONSTRUCTION DRAWING. THE CONTRACTOR HAS TO TAKE PRIOR APPROVAL TO THE PROCESS OF MANUFACTURE OF THE PRECAST MANHOLE.
12. NET SAFE BEARING CAPACITY IS ASSUMED TO BE 10 TON/Sq.m. IF LOWER SBC ENCOUNTERED, THE BASE SLAB THICKNESS SHALL BE INCREASED AS PER DIRECTION OF ENGINEER.
13. PRE CAST FRAME AND COVER AS PER IS:12592-2002.
14. LOWEST FOOT REST SHALL NOT BE MORE THAN 300mm ABOVE BENCHING.
15. FOR MINIMUM DEPTH-MANHOLES(1.25m), WHEREVER OCCURS,THE CONICAL SECTION AND THE RISER SEGMENT (H1) MAY BE CAST AS A SINGLE UNIT BASED ON THE SITE CONDITIONS.
16. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED
17. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
18. INCASE OF HIGHER DIAMETER PIPES, PROVISION FOR THE INCOMING AND OUTGOING SEWERS MAY BE PROVIDED IN TWO PRECAST MEMEBERS OR HEIGHT OF THE BOTTOM PRECAST MEMBERS MAY BE INCREASED
19. ADDITION REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
20. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
21. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.

LEGEND:

FGL	FINISHED GROUND LEVEL
RL	REDUCED LEVEL
LVL	LEVEL
THK	THICKNESS
TYP	TYPICAL
BW	BOTH WAYS
BF	BOTH FACES
RF/REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL

ISSUE	DATE	DESCRIPTION					
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	-	-	
			BY	CIVIL	-	-	APPD.
			CHECKED				

FOR TENDER PURPOSE ONLY

BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

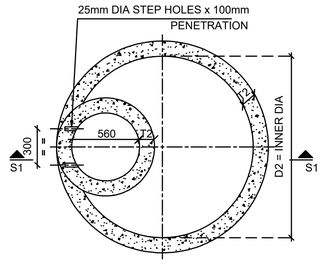
TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1800mm DIA (TYPICAL) FOR DEPTH UPTO 6.0M

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

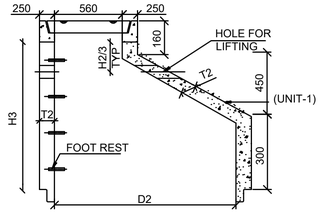
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE: (CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: AS SHOWN	DWG. NO. TN-KWSDRP-WBS2B-CV-3030	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3030.dwg		A1 SIZE

TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1800MM DIA (TYPICAL) FOR DEPTH UPTO 8.0M

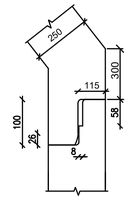
DWG NO: TN-KWSDRP-WBS2B-CV-3031



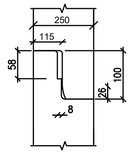
1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



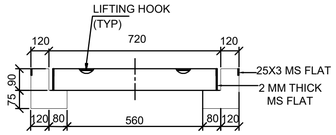
3 DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS



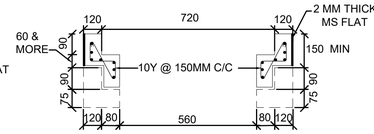
DETAIL OF 'Y'
TYP.JOINING DETAILS OF 1800 DIA PRECAST SEGMENT



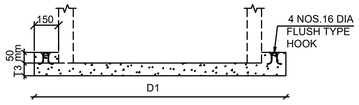
DETAILS OF 'Z'
TYP.JOINING DETAILS OF 1800 DIA PRECAST SEGMENT



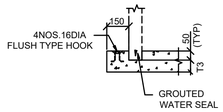
DETAIL OF 'X'
HD-20 MACHINE HOLE COVER



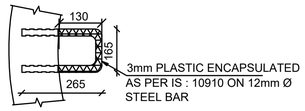
ADDITIONAL MACHINE HOLE HEIGHT TO MATCH FINISHED ROAD LEVEL



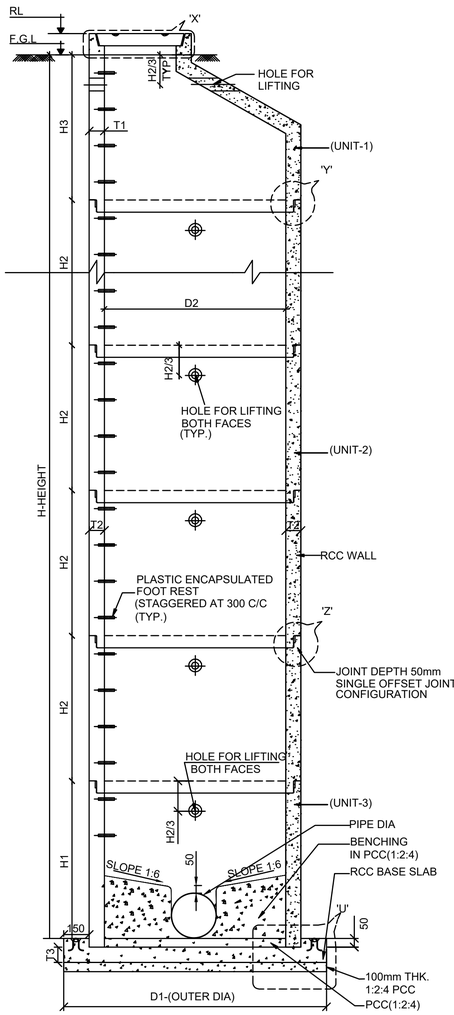
DETAILS OF BASE SLAB



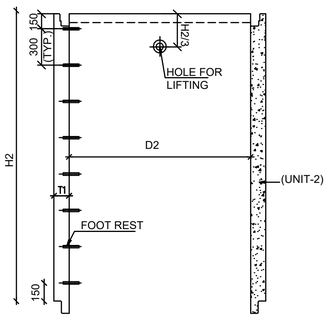
DETAIL OF 'U'



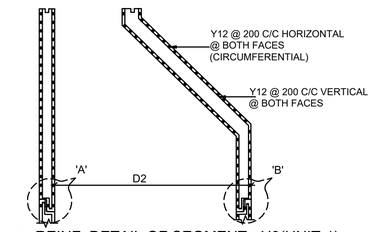
TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS



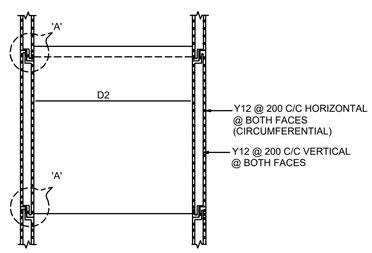
2 SECTION S1-S1
SCALE:NTS



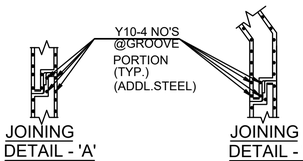
4 DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS



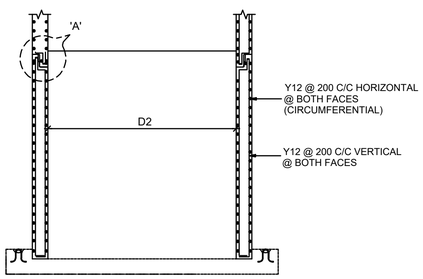
5 REINF. DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS



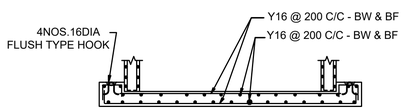
6 REINF. DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS



JOINING DETAIL - 'A'
JOINING DETAIL - 'B'



7 REINF. DETAIL OF SEGMENT - H1(UNIT-3)
SCALE : NTS



8 REINF. DETAIL OF BASE SLAB
SCALE : NTS

STANDARD DATA FOR PRECAST MACHINE HOLE								
1	**BASE SECTION**							PROVISION
a)	SIZE(DIAMETER) IN mm							1800
b)	DIA WISE DIMENSIONS							
	INNER DIA.OF BASE(D2) (mm)	WALL THK.(T1) (mm)	WALL THK.(T2) (mm)	JOINT DEPTH (mm)	BASE THK.(T3) (mm)	OUTER DIA.OF BASE(D1) (mm)	HEIGHT	
	1800	250	250	50	350	2600	UPTO 8m	
c)	AVAILABLE HEIGHT FOR BASE IN MM(H1)							300 TO 700 OR AS REQUIRED
d)	HOLES FOR SEWER CONNECTIONS							100mmØ MORE THAN OUTER Ø OF SEWER
e)	A)MAT CONCRETE THICKNESS IN MM & MIX							100mmTHICK,1:2:4 MIX
	B)CONCRETE MIX FOR WALL AND BASE							RCC M30 GRADE
f)	CONCRETE FILL FOR BENCHING							1:2:4, MIX WITH 1:6 SLOPE
g)	REINFORCEMENT							
	a)FOR BASE SLAB							AS PER RC DETAIL
	b)FOR WALL							AS PER RC DETAIL
2	**RISER SECTION**							
a)	AVAILABLE HEIGHT FOR RISER SECTION (H2)							300 TO 900 OR AS REQUIRED
b)	WALL THICKNESS IN MM							250mm
c)	JOINT THICKNESS AND JOINT MATERIAL							SAME AS BASE SECTION
d)	REINFORCEMENT IN THE WALL							AS PER DETAIL DRG.
3	**ECCENTRIC CONE SECTION**							
a)	SHAPE							ECCENTRIC CONE
b)	CONCRETE FILL AROUND SEWER							1:1.5:3MIX
c)	THICKNESS(T2)							250mm
d)	REINFORCEMENT							AS PER DETAIL DRG.
e)	TOP OPENING							560mm
f)	JOINT DEPTH							AS PER DETAIL DRG.
4	**STANDARD** MACHINE HOLE **FRAME AND COVER**							AS PER IS 12592-2002
a)	SHAPE							FLAT
b)	COVER SIZE							560mm
c)	SPECIFICATION							HD-20

NOTE:

1. ALL DIMENTIONS ARE IN mm AND ALL LEVELS ARE IN METER.
2. THE LIFTING HOLES SHALL BE FILLED WITH CONCRETE 1:1.5:3 MIX.
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LEGEND:

FGL	FINISHED GROUND LEVEL
RL	REDUCED LEVEL
LVL	LEVEL
THK	THICKNESS
TYP	TYPICAL
BW	BOTH WAYS
BF	BOTH FACES
RF/REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL

ISSUE	DATE	DESCRIPTION					
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	-	-	
			BY	CIVIL	-	-	APPD.
			CHECKED				

FOR TENDER PURPOSE ONLY

BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

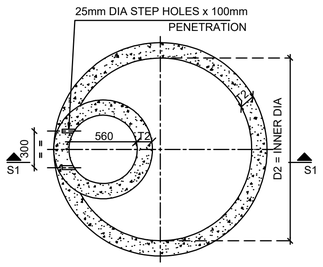
TITLE:
RCC PRECAST SEWER MACHINE HOLE DETAILS 1800mm DIA (TYPICAL) FOR DEPTH UPTO 8.0M

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

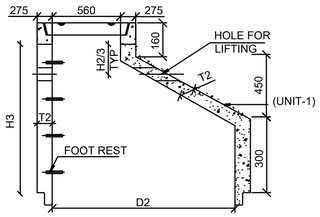
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE: (CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3031	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3031.dwg		A1 SIZE

TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1800MM DIA (TYPICAL) FOR DEPTH UPTO 10.0M

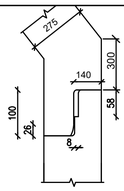
DWG NO: TN-KWSDRP-WBS2B-CV-3032



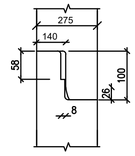
1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



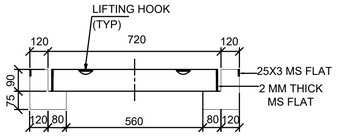
3 DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS



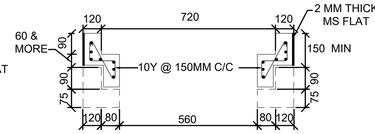
DETAIL OF 'Y'
TYP.JOINING DETAILS OF 1800 DIA PRECAST SEGMENT



DETAILS OF 'Z'
TYP.JOINING DETAILS OF 1800 DIA PRECAST SEGMENT

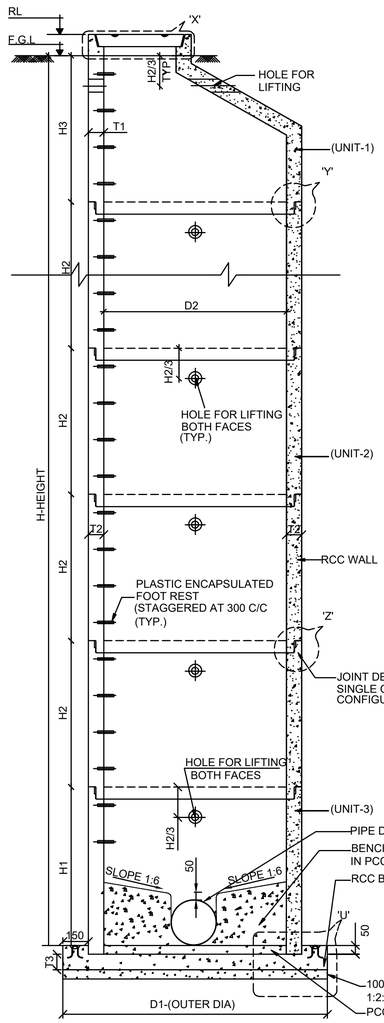


DETAIL OF 'X'
HD-20 MACHINE HOLE COVER

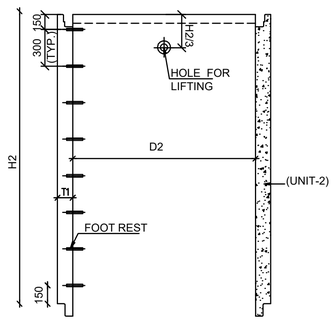


ADDITIONAL MACHINE HOLE HEIGHT TO MATCH FINISHED ROAD LEVEL

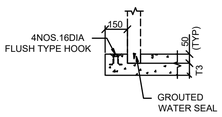
DETAILS OF BASE SLAB



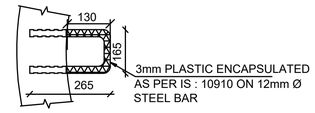
2 SECTION S1-S1
SCALE:NTS



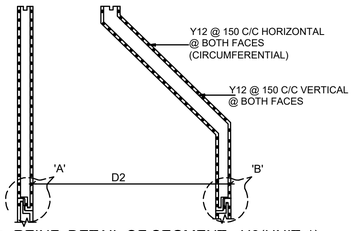
4 DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS



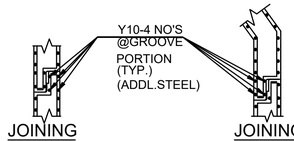
DETAIL OF 'U'



TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS

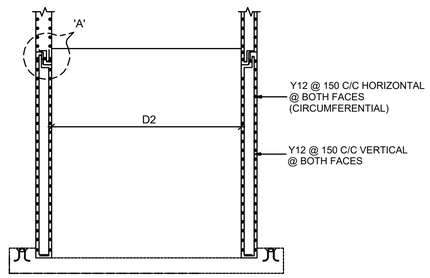


5 REINF. DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS

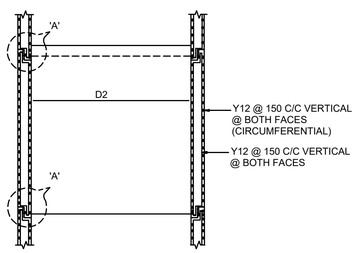


JOINING DETAIL - 'A'

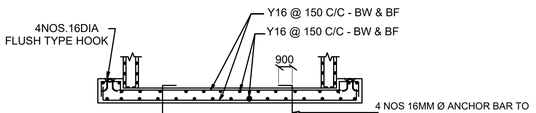
JOINING DETAIL - 'B'



7 REINF. DETAIL OF SEGMENT - H1(UNIT-3)
SCALE : NTS



6 REINF. DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS



8 REINF. DETAIL OF BASE SLAB
SCALE : NTS

STANDARD DATA FOR PRECAST MACHINE HOLE								
1	**BASE SECTION**							PROVISION
a)	SIZE(DIAMETER) IN mm							1800
b)	DIA WISE DIMENSIONS							
	INNER DIA.OF BASE(D2) (mm)	WALL THK.(T1) (mm)	WALL THK.(T2) (mm)	JOINT DEPTH (mm)	BASE THK.(T3) (mm)	OUTER DIA.OF BASE(D1) (mm)	HEIGHT	
	1800	275	275	50	350	2650	UPTO 10m	
c)	AVAILABLE HEIGHT FOR BASE IN MM(H1)							300 TO 700 OR AS REQUIRED
d)	HOLES FOR SEWER CONNECTIONS							100mmØ MORE THAN OUTER Ø OF SEWER
e)	A)MAT CONCRETE THICKNESS IN MM & MIX							100mmTHICK,1:2:4 MIX
	B)CONCRETE MIX FOR WALL AND BASE							RCC M30 GRADE
f)	CONCRETE FILL FOR BENCHING							1:2:4, MIX WITH 1:6 SLOPE
g)	REINFORCEMENT							
	a)FOR BASE SLAB							AS PER RC DETAIL
	b)FOR WALL							AS PER RC DETAIL
2	**RISER SECTION**							
a)	AVAILABLE HEIGHT FOR RISER SECTION (H2)							300 TO 900 OR AS REQUIRED
b)	WALL THICKNESS IN MM							275mm
c)	JOINT THICKNESS AND JOINT MATERIAL							SAME AS BASE SECTION
d)	REINFORCEMENT IN THE WALL							AS PER DETAIL DRG.
3	**ECCENTRIC CONE SECTION**							
a)	SHAPE							ECCENTRIC CONE
b)	CONCRETE FILL AROUND SEWER							1:1.5:3MIX
c)	THICKNESS(T2)							275mm
d)	REINFORCEMENT							AS PER DETAIL DRG.
e)	TOP OPENING							560mm
f)	JOINT DEPTH							AS PER DETAIL DRG.
4	**STANDARD** MACHINE HOLE **FRAME AND COVER**							AS PER IS 12592-2002
a)	SHAPE							FLAT
b)	COVER SIZE							560mm
c)	SPECIFICATION							HD-20

NOTE:

1. ALL DIMENTIONS ARE IN mm AND ALL LEVELS ARE IN METER.
2. THE LIFTING HOLES SHALL BE FILLED WITH CONCRETE 1:1.5:3 MIX.
3. 3mm PVC ENCAPSULATE ON 12mm BAR, FOOT STEPS Fe 500.
4. THE NON CORE OPENING SHALL BE 100mm GREATER THAN THE OUTER DIA OF SEWER
5. SINGLE OFFSET JOINT CONFIGURATION SHALL BE ADOPTED AT THE JOINT.
6. THE JOINT SHALL BE SEALED WITH NON SHRINK GROUT/SINGLE RUBBER SEAL SHALL BE PROVIDED IN PRECAST UNITS.RUBBER GASKET SHALL BE AS PER IS 5382.
7. 150mm LIP IS OPTIONAL UNLESS OTHERWISE NOTED.
8. GRADE OF CONCRETE SHALL BE RCC M30 MIX FOR MANHOLE WALL AND FOR BASE SLAB WITH SULPHATE RESISTANCE CEMENT.
9. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFORMING TO IS:1786.
10. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE:
    a)WALL SOIL SEWAGE FACE=50mm
    b)BASE SLAB =50mm
11. THIS DRAWING IS ONLY TYPICAL CONSTRUCTION DRAWING. THE CONTRACTOR HAS TO TAKE PRIOR APPROVAL TO THE PROCESS OF MANUFACTURE OF THE PRECAST MANHOLE.
12. NET SAFE BEARING CAPACITY IS ASSUMED TO BE 10 TON/Sq.m. IF LOWER SBC ENCOUNTERED, THE BASE SLAB THICKNESS SHALL BE INCREASED AS PER DIRECTION OF ENGINEER.
13. PRE CAST FRAME AND COVER AS PER IS:12592-2002.
14. LOWEST FOOT REST SHALL NOT BE MORE THAN 300mm ABOVE BENCHING.
15. FOR MINIMUM DEPTH-MANHOLES(1.25m), WHEREVER OCCURS,THE CONICAL SECTION AND THE RISER SEGMENT (H1) MAY BE CAST AS A SINGLE UNIT BASED ON THE SITE CONDITIONS.
16. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED
17. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
18. INCASE OF HIGHER DIAMETER PIPES, PROVISION FOR THE INCOMING AND OUTGOING SEWERS MAY BE PROVIDED IN TWO PRECAST MEMEBERS OR HEIGHT OF THE BOTTOM PRECAST MEMBERS MAY BE INCREASED
19. ADDITION REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
20. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
21. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.

LEGEND:

FGL	FINISHED GROUND LEVEL
RL	REDUCED LEVEL
LVL	LEVEL
THK	THICKNESS
TYP	TYPICAL
BW	BOTH WAYS
BF	BOTH FACES
RF/REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL

ISSUE	DATE	DESCRIPTION	BY	CHECKED	APPD.
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	- -

FOR TENDER PURPOSE ONLY

BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

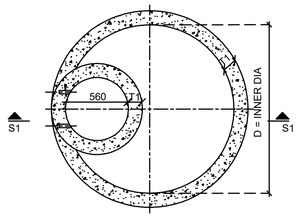
TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS 1800mm DIA (TYPICAL) FOR DEPTH UPTO 10.0M

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

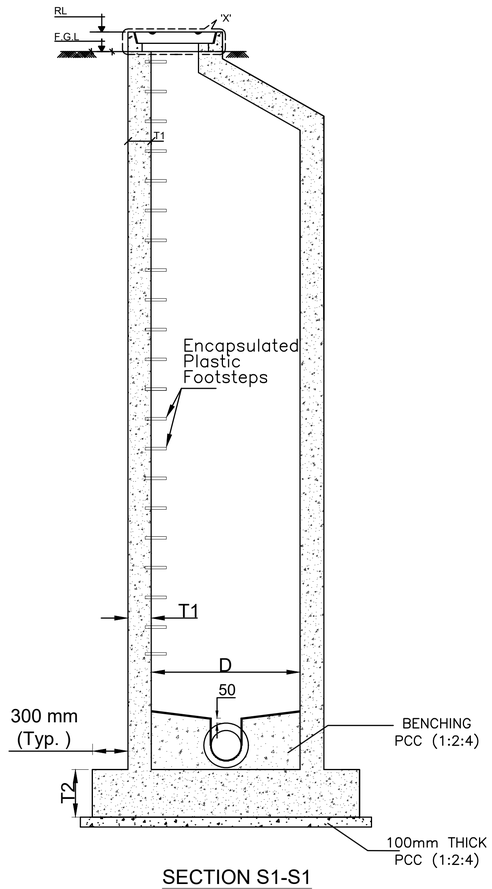
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE: (CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3032	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3032.dwg		A1 SIZE

TITLE: STANDARD DETAILS OF R.C.C CAST IN-SITU MACHINE HOLE 1200MM,1500MM,1800MM DIA UPTO 3.0M 1500MM,1800MM DIA UPTO 6M DEPTH (TYPICAL)

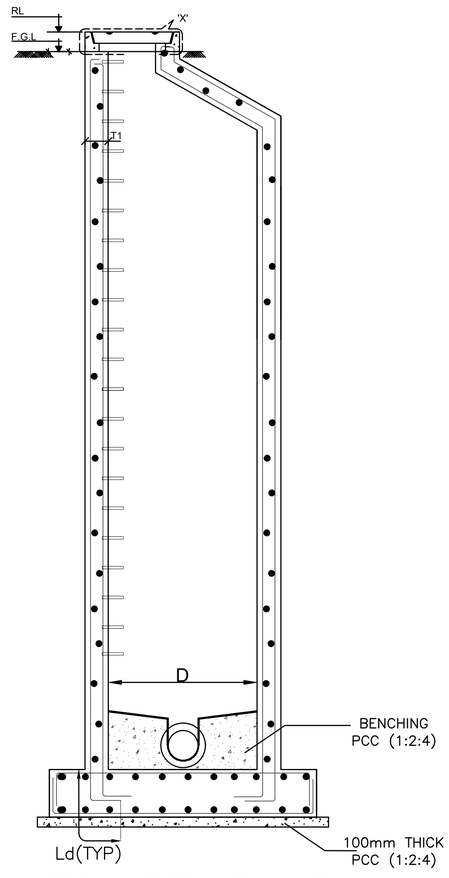
DWG NO: TN-KWSDRP-WBS2B-CV-3033



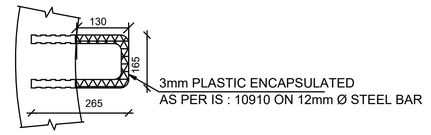
1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



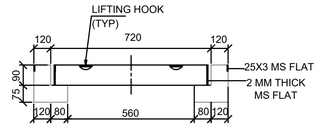
SECTION S1-S1
SECTIONAL DETAILS OF MACHINE HOLE



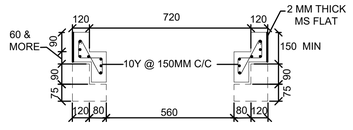
RC DETAILS OF MACHINE HOLE



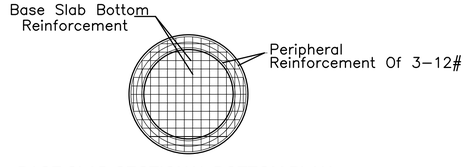
TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS



DETAIL OF 'X'
HD-20 MACHINE HOLE COVER



ADDITIONAL MACHINE HOLE HEIGHT TO MATCH FINISHED ROAD LEVEL



BASE SLAB-SECTIONAL BOTTOM PLAN

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED FROM THE DRAWING.
3. ALL DRAWINGS ARE INTERRELATED AND SHALL BE READ IN CONJUNCTION WITH ONE ANOTHER.
4. GRADE OF CONCRETE MIX SHALL BE M30 CONFIRMING TO I.S 456-2000.
5. ONLY SULPHATE RESISTING CEMENT CONFIRMING TO IS:12330:1988 SHALL BE USED FOR ALL CONCRETING WORKS.
6. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFIRMING TO IS:1786.
7. ANY CHANGE IN SBC OF SOIL LESS THAN 12 TON THE DESIGN OF FOUNDATION SHALL BE REVISED AS PER ACTUAL SBC.
8. TOP OF MANHOLE COVER SHALL BE FLUSH WITH FINISHED ROAD LEVEL AND AS DIRECTED BY ENGINEER.
9. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED.
10. #, ₹ DENOTES HYSD BARS
11. 3mm PVC ENCAPSULATED 12mm BAR, FOOT STEPS IN Fe 500
12. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
13. ADDITION REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
14. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
15. THE WORK SHALL BE DONE AS PER SPECIFICATIONS.
16. DEVELOPMENT LENGTH Ld = 46D WHERE D IS DIAMETER OF BAR.

TABLE - 1
DIMENSION DETAILS OF MACHINE HOLE

SL.No	(Dia of Manhole) in 'mm'	(Wall height) in 'mm'	(Wall thickness) in 'mm'	(Base Slab thickness) in 'mm'
	D	H	T1	T2
1	1200	Upto 3000	200	200
2	1500	Upto 3000	200	200
3	1800	Upto 3000	200	200
4	1500	Upto 6000	250	300
5	1800	Upto 6000	250	300

TABLE - 2
REINFORCEMENT DETAILS OF MACHINE HOLE

SL.No	(Dia of Manhole) in 'mm'	(Wall height) in 'mm'	Base Slab Reinforcement (Bothways-Top & Bottom)	Wall Reinforcement	
				Hoop Reinforcement	Longitudinal Reinforcement
	D	H			
1	1200	Upto 3000	Y10@200c/c	Y10@200c/c	Y10@200c/c
2	1500	Upto 3000	Y10@200c/c	Y10@200c/c	Y10@200c/c
3	1800	Upto 3000	Y12@200c/c	Y12@200c/c	Y12@200c/c
4	1500	Upto 6000	Y12@150c/c	Y12@150c/c	Y12@150c/c
5	1800	Upto 6000	Y12@150c/c	Y12@150c/c	Y12@150c/c

LEGEND:

FGL	FINISHED GROUND LEVEL
RL	REDUCED LEVEL
LVL	LEVEL
THK	THICKNESS
TYP	TYPICAL
BW	BOTH WAYS
BF	BOTH FACES
RF/REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL

ISSUE	DATE	DESCRIPTION	BY	CHECKED	APPD.
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	– –

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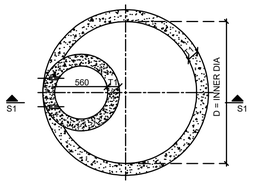
TITLE: STANDARD DETAILS OF R.C.C CAST IN-SITU MACHINE HOLE 1200mm,1500mm,1800mm DIA UPTO 3.0m 1500mm,1800mm DIA UPTO 6m DEPTH (TYPICAL)

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

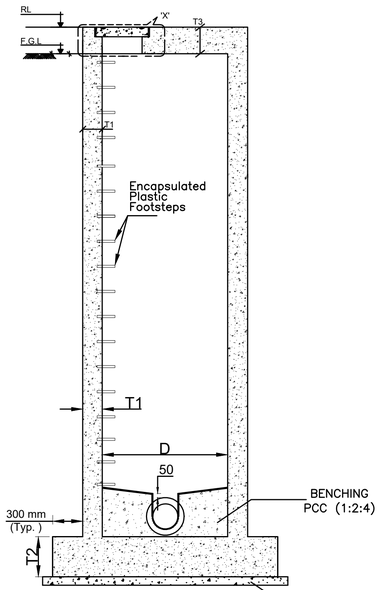
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE:(CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3033	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3033.dwg		A1 SIZE

TITLE: RCC CAST IN SITU MACHINE HOLE 1200MM, 1500MM & 1800MM DIA UPTO 3.0M 6M DEPTH (TYPICAL)

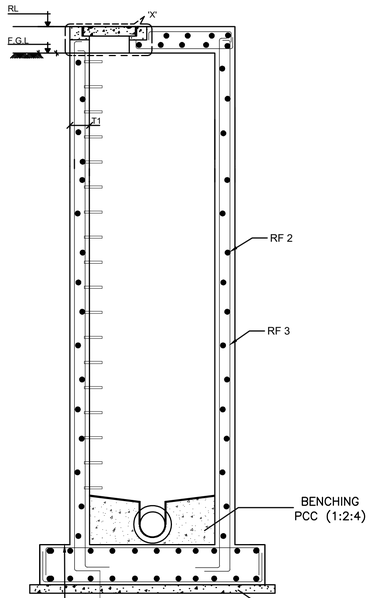
DWG NO: TN-KWSDRP-WBS2B-CV-3034



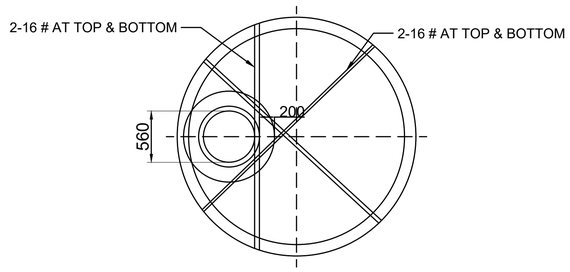
1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



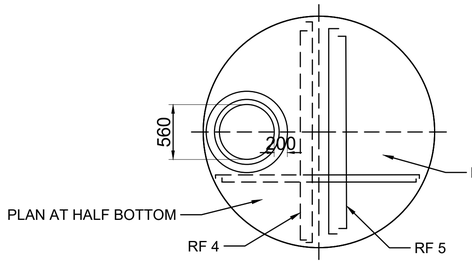
SECTION S1–S1
SECTIONAL DETAILS OF MACHINE HOLE



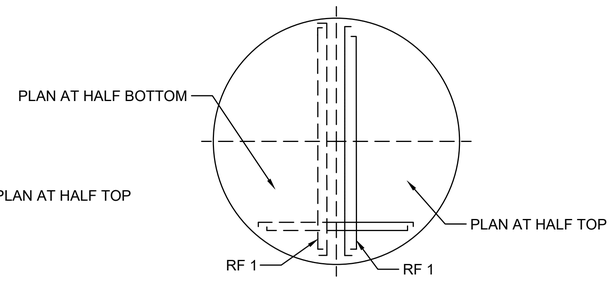
RC DETAILS OF MACHINE HOLE



ADDITIONAL REINFORCEMENT DETAIL AROUND MACHINE HOLE OPENING



MACHINE HOLE TOP SLAB



MACHINE HOLE BOTTOM RAFT SLAB

TABLE - 2

REINFORCEMENT DETAILS OF MACHINE HOLE

SL.No	(Dia of Manhole) in 'mm'	(Wall height) in 'mm'	Base Slab Reinforcement (Bothways-Top & Bottom)	Wall Reinforcement		Top Slab Reinforcement	
				Hoop Reinforcement	Longitudinal Reinforcement (Vertical)	Bothways Bottom	Bothways Top
	D	H	RF1	RF2	RF3	RF4	RF5
1	1200	Upto 3000	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y16@125c/c	Y10@125c/c
2	1500	Upto 3000	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y16@125c/c	Y10@125c/c
3	1800	Upto 3000	Y12@200c/c	Y12@200c/c	Y12@200c/c	Y16@100c/c	Y10@100c/c
4	1500	Upto 6000	Y12@150c/c	Y12@150c/c	Y12@150c/c	Y16@125c/c	Y10@125c/c
5	1800	Upto 6000	Y12@150c/c	Y12@150c/c	Y12@150c/c	Y16@100c/c	Y10@100c/c

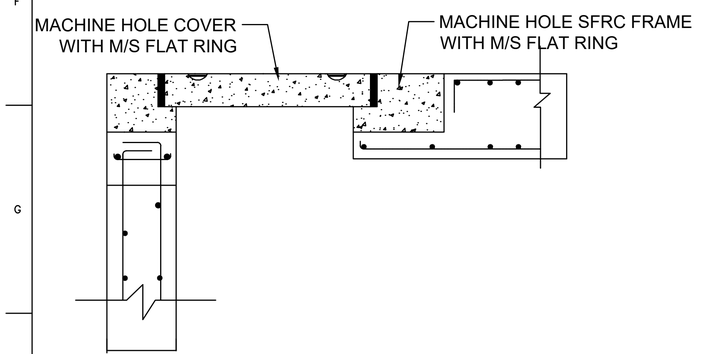
TABLE - 1

DIMENSION DETAILS OF MACHINE HOLE

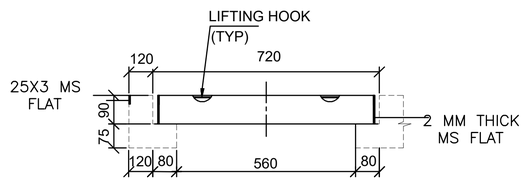
SL.No	(Dia of Manhole) in 'mm'	(Wall height) in 'mm'	(Wall thickness) in 'mm'	(Base Slab thickness) in 'mm'	Top Slab Thickness
	D	H	T1	T2	T3
1	1200	Upto 3000	200	200	300
2	1500	Upto 3000	200	200	300
3	1800	Upto 3000	200	200	300
4	1500	Upto 6000	300	300	300
5	1800	Upto 6000	300	300	300

NOTE:

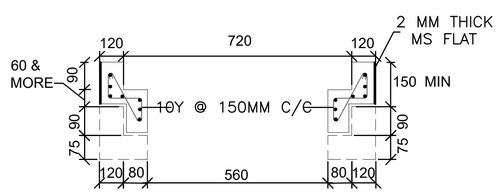
1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED FROM THE DRAWING.
3. ALL DRAWINGS ARE INTERRELATED AND SHALL BE READ IN CONJUNCTION WITH ONE ANOTHER.
4. GRADE OF CONCRETE MIX SHALL BE M30 CONFIRMING TO I.S 456–2000.
5. ONLY SULPHATE RESISTING CEMENT CONFIRMING TO IS:12330:1988 SHALL BE USED FOR ALL CONCRETING WORKS.
6. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFIRMING TO IS:1786.
7. ANY CHANGE IN SBC OF SOIL LESS THAN 12 TON THE DESIGN OF FOUNDATION SHALL BE REVISED AS PER ACTUAL SBC.
8. TOP OF MANHOLE COVER SHALL BE FLUSH WITH FINISHED ROAD LEVEL AND AS DIRECTED BY ENGINEER.
9. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED.
10. #, DENOTES HYSD BARS
11. 3mm PVC ENCAPSULATED 12mm BAR, FOOT STEPS IN Fe 500
12. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
13. ADDITION REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
14. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
15. THE WORK SHALL BE DONE AS PER SPECIFICATIONS.
16. DEVELOPMENT LENGTH Ld = 46D WHERE D IS DIAMETER OF BAR.



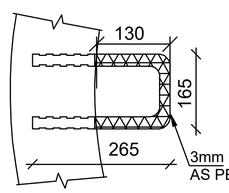
RCC MACHINE HOLE COVER AND FRAME



DETAIL OF 'X'
HD-20 MACHINE HOLE COVER



ADDITIONAL MACHINE HOLE HEIGHT TO MATCH FINISHED ROAD LEVEL



TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS

LEGEND:

FGL	FINISHED GROUND LEVEL
RL	REDUCED LEVEL
LVL	LEVEL
THK	THICKNESS
TYP	TYPICAL
BW	BOTH WAYS
BF	BOTH FACES
RF/REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL

ISSUE	DATE	DESCRIPTION	BY	CHECKED	APPD.
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	– –

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BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

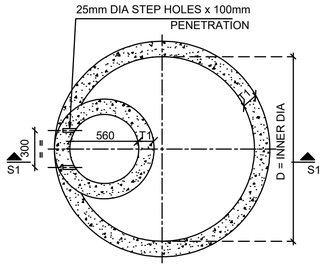
TITLE: RCC CAST IN SITU MACHINE HOLE 1200MM, 1500MM & 1800MM DIA UPTO 3.0M 6M DEPTH (TYPICAL)

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

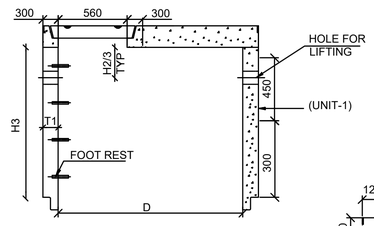
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE:(CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3034	ISSUE: P0
FILE NAME: TN–KWSDRP–WBS2B–CV–3034.dwg		A1 SIZE

TITLE: RCC PRECAST SEWER MACHINE HOLE DETAILS FOR 1200, 1500 & 1800 DIA (VERTICAL WALL)

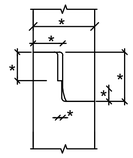
DWG NO: TN-KWSDRP-WBS2B-CV-3035



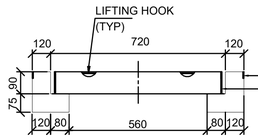
1 PLAN AT MACHINE HOLE TOP LVL
SCALE : NTS



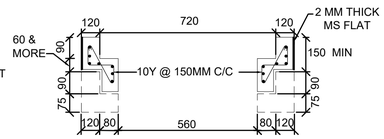
3 DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS



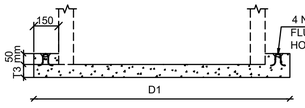
DETAILS OF 'Z'
TYP.JOINING DETAILS OF PRECAST SEGMENT (REFER PRECAST DRAWINGS 1002 TO 1012 FOR DETAILS)



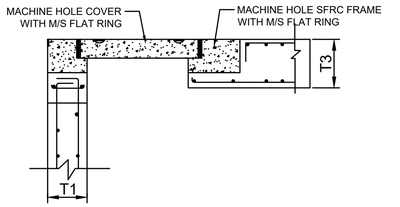
DETAIL OF 'X'
HD-20 MACHINE HOLE COVER



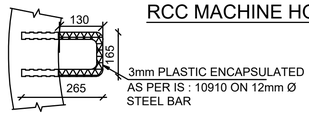
ADDITIONAL MACHINE HOLE HEIGHT TO MATCH FINISHED ROAD LEVEL



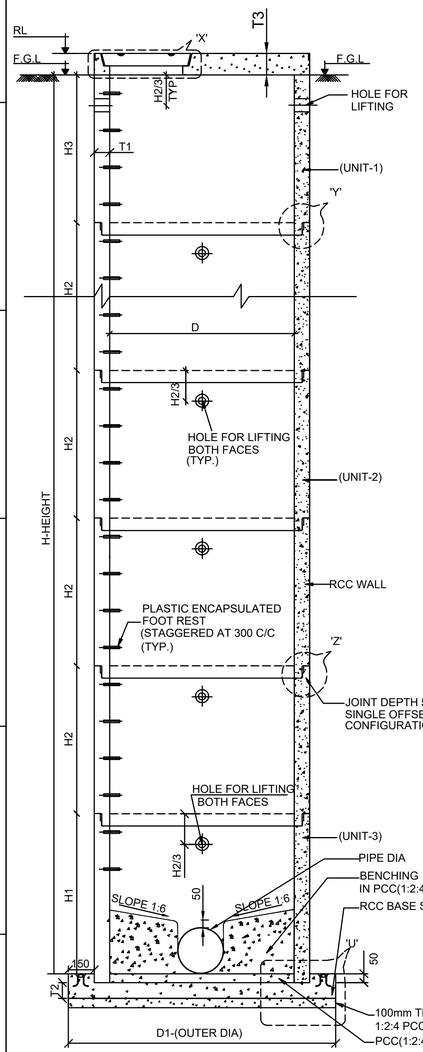
DETAILS OF BASE SLAB



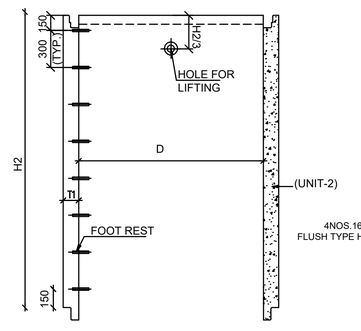
RCC MACHINE HOLE COVER AND FRAME



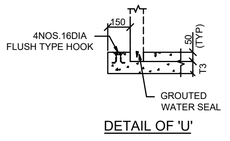
TYPICAL PLASTIC ENCAPSULATED FOOT REST DETAILS



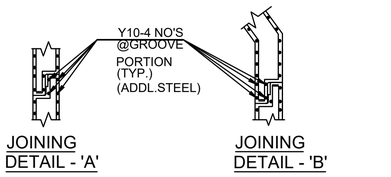
2 SECTION S1-S1
SCALE:NTS



4 DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS

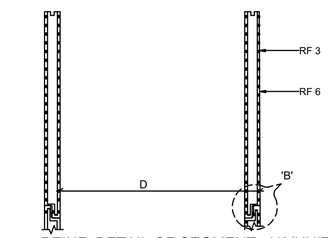


DETAIL OF 'U'

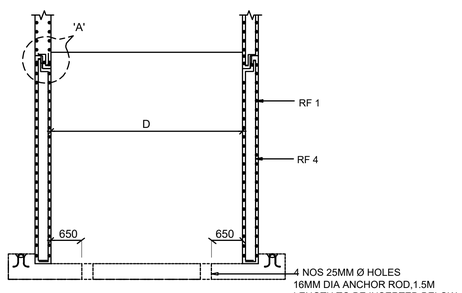


JOINING DETAIL - 'A'

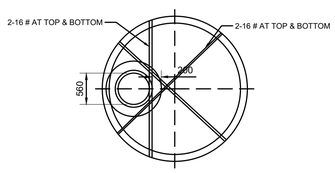
JOINING DETAIL - 'B'



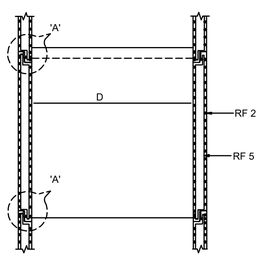
5 REINF. DETAIL OF SEGMENT - H3(UNIT-1)
SCALE : NTS



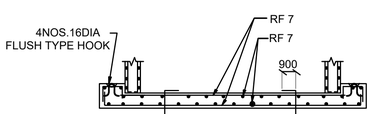
7 REINF. DETAIL OF SEGMENT - H1(UNIT-3)
SCALE : NTS



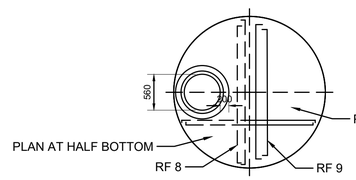
ADDITIONAL REINFORCEMENT DETAIL AROUND MACHINE HOLE OPENING



6 REINF. DETAIL OF SEGMENT - H2(UNIT-2)
SCALE : NTS



8 REINF. DETAIL OF BASE SLAB
SCALE : NTS



MACHINE HOLE TOP SLAB

DIMENSION DETAILS OF MACHINE HOLE

SL.No	(Dia of Manhole) in 'mm'	(Wall height) in 'mm'	(Wall thickness) in 'mm'	Joint Depth	Base Slab thickness in 'mm'	Over Dia	TOP Slab thickness in 'mm'
	D	H1	T1		T2	D1	T3
1	1200	Upto 3000	200	50	200	1900	300
2	1500	Upto 3000	200	50	250	2200	300
3	1500	Upto 7000	250	50	300	2300	300
4	1800	Upto 3000	200	50	300	2500	300
5	1800	Upto 6000	250	50	300	2600	300
6	1800	Upto 8000	250	50	350	2600	300
7	1800	Upto 10000	275	50	350	2650	300

STANDARD DATA FOR PRECAST MACHINE HOLE		
1	**DETAILS OF MANHOLE**	PROVISION
a)	AVAILABLE HEIGHT FOR BASE IN MM(H1)	300 TO 700 OR AS REQUIRED
b)	HOLES FOR SEWER CONNECTIONS	100mmØ MORE THAN OUTER Ø OF SEWER
c)	A)MAT CONCRETE THICKNESS IN MM & MIX	100mmTHICK,1:2:4 MIX
	B)CONCRETE MIX FOR WALL AND BASE	RCC M30 GRADE
d)	CONCRETE FILL FOR BENCHING	1:2:4, MIX WITH 1:6 SLOPE
e)	REINFORCEMENT	
	a)FOR BASE SLAB	AS PER RC DETAIL
	b)FOR WALL	AS PER RC DETAIL
2	**RISER SECTION**	
a)	AVAILABLE HEIGHT FOR RISER SECTION (H2)	300 TO 900 OR AS REQUIRED
b)	WALL THICKNESS IN MM	200mm
c)	JOINT THICKNESS AND JOINT MATERIAL	SAME AS BASE SECTION
d)	REINFORCEMENT IN THE WALL	AS PER DETAIL DRG.
3	**STANDARD MANHOLE FRAME AND COVER**	AS PER IS 12592-2002
a)	SHAPE	FLAT
b)	COVER SIZE	560mm
c)	SPECIFICATION	HD-20

NOTE:

1. ALL DIMENTIONS ARE IN mm AND ALL LEVELS ARE IN METER.
2. THE LIFTING HOLES SHALL BE FILLED WITH CONCRETE 1:1.5:3 MIX.
3. 3mm PVC ENCAPSULATE ON 12mm BAR, FOOT STEPS Fe 500.
4. THE NON CORE OPENING SHALL BE 100mm GREATER THAN THE OUTER DIA OF SEWER.
5. SINGLE OFFSET JOINT CONFIGURATION SHALL BE ADOPTED AT THE JOINT.
6. THE JOINT SHALL BE SEALED WITH NON SHRINK GROUT/SINGLE RUBBER SEAL SHALL BE PROVIDED IN PRECAST UNITS.RUBBER GASKET SHALL BE AS PER IS 5382.
7. 150mm LIP IS OPTIONAL UNLESS OTHERWISE NOTED.
8. GRADE OF CONCRETE SHALL BE RCC M30 MIX FOR MANHOLE WALL AND FOR BASE SLAB WITH SULPHATE RESISTANCE CEMENT.
9. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFORMING TO IS:1786.
10. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE:
    a)WALL SOIL SEWAGE FACE=50mm
    b)BASE SLAB =50mm
11. THIS DRAWING IS ONLY TYPICAL CONSTRUCTION DRAWING. THE CONTRACTOR HAS TO TAKE PRIOR APPROVAL TO THE PROCESS OF MANUFACTURE OF THE PRECAST MANHOLE.
12. NET SAFE BEARING CAPACITY IS ASSUMED TO BE 10 TON/Sq.m. IF LOWER SBC ENCOUNTERED, THE BASE SLAB THICKNESS SHALL BE INCREASED AS PER DIRECTION OF ENGINEER.
13. PRE CAST FRAME AND COVER AS PER IS:12592-2002.
14. LOWEST FOOT REST SHALL NOT BE MORE THAN 300mm ABOVE BENCHING.
15. FOR MINIMUM DEPTH-MANHOLES(1.25m), WHEREVER OCCURS,THE CONICAL SECTION AND THE RISER SEGMENT (H1) MAY BE CAST AS A SINGLE UNIT BASED ON THE SITE CONDITIONS.
16. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED
17. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
18. INCASE OF HIGHER DIAMETER PIPES, PROVISION FOR THE INCOMING AND OUTGOING SEWERS MAY BE PROVIDED IN TWO PRECAST MEMEBERS OR HEIGHT OF THE BOTTOM PRECAST MEMBERS MAY BE INCREASED
19. ADDITION REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
20. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
21. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.
22. *REFER RELEVANT PRECAST SECTION FROM DRAWING No. 1002 TO 1012 FOR SECTIONAL DETAILS.

LEGEND:

FGL	FINISHED GROUND LEVEL	NTS	NOT TO SCALE
RL	REDUCED LEVEL	CB	CIRCULAR BEAM
LVL	LEVEL	RCC	REINFORCED CEMENT CONCRETE
THK	THICKNESS	MAX	MAXIMUM
TYP	TYPICAL	DI	DUCTILE IRON
BW	BOTH WAYS	ADDL	ADDITIONAL
BF	BOTH FACES	PCC	PLAIN CEMENT CONCRETE
RF/REINF	REINFORCEMENT	C/C	CENTER-TO-CENTER
DIA	DIAMETER	HFL	HIGH FLOOD LEVEL
		MIN	MINIMUM
		M/S	MILD STEEL

REINFORCEMENT DETAILS OF MACHINE HOLE

SL.No	(Dia of Manhole) in 'mm'	(Wall height) in 'mm'	HOOP			VERTICAL R/F			Base Slab Reinforcement (Bothways-Top & Bottom)	Top Slab Reinforcement	
			H1	H2	H3	H1	H2	H3		Bothways Bottom	Bothways Top
	D	H	RF1	RF2	RF3	RF4	RF5	RF6	RF7	RF8	RF9
1	1200	Upto 3000	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y16@125c/c	Y16@125c/c
2	1500	Upto 3000	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y16@125c/c	Y16@125c/c
3	1500	Upto 7000	Y10@150c/c	Y10@150c/c	Y10@150c/c	Y10@150c/c	Y10@150c/c	Y10@150c/c	Y12@200c/c	Y16@125c/c	Y16@125c/c
4	1800	Upto 3000	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y12@200c/c	Y16@100c/c	Y10@100c/c
5	1800	Upto 6000	Y10@150c/c	Y10@150c/c	Y10@150c/c	Y10@150c/c	Y10@150c/c	Y10@150c/c	Y12@200c/c	Y16@100c/c	Y10@100c/c
6	1800	Upto 8000	Y12@200c/c	Y12@200c/c	Y12@200c/c	Y12@200c/c	Y12@200c/c	Y12@200c/c	Y16@200c/c	Y16@100c/c	Y10@100c/c
7	1800	Upto 10000	Y12@150c/c	Y12@150c/c	Y12@150c/c	Y12@150c/c	Y12@150c/c	Y12@150c/c	Y16@150c/c	Y16@100c/c	Y10@100c/c

ISSUE	DATE	DESCRIPTION					APPD.
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	-	-	
			BY	CIVIL	-	-	
			CHECKED				

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BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

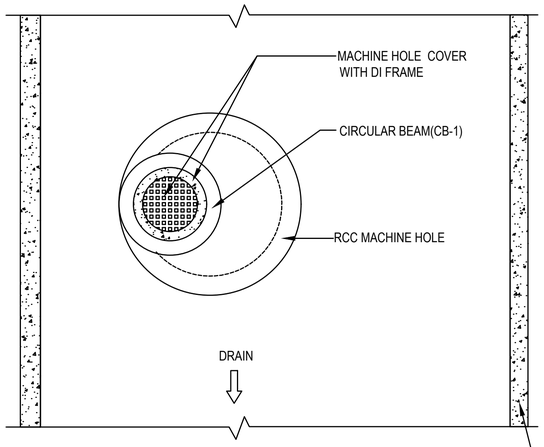
PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE: (CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3035	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3035.dwg		A1 SIZE

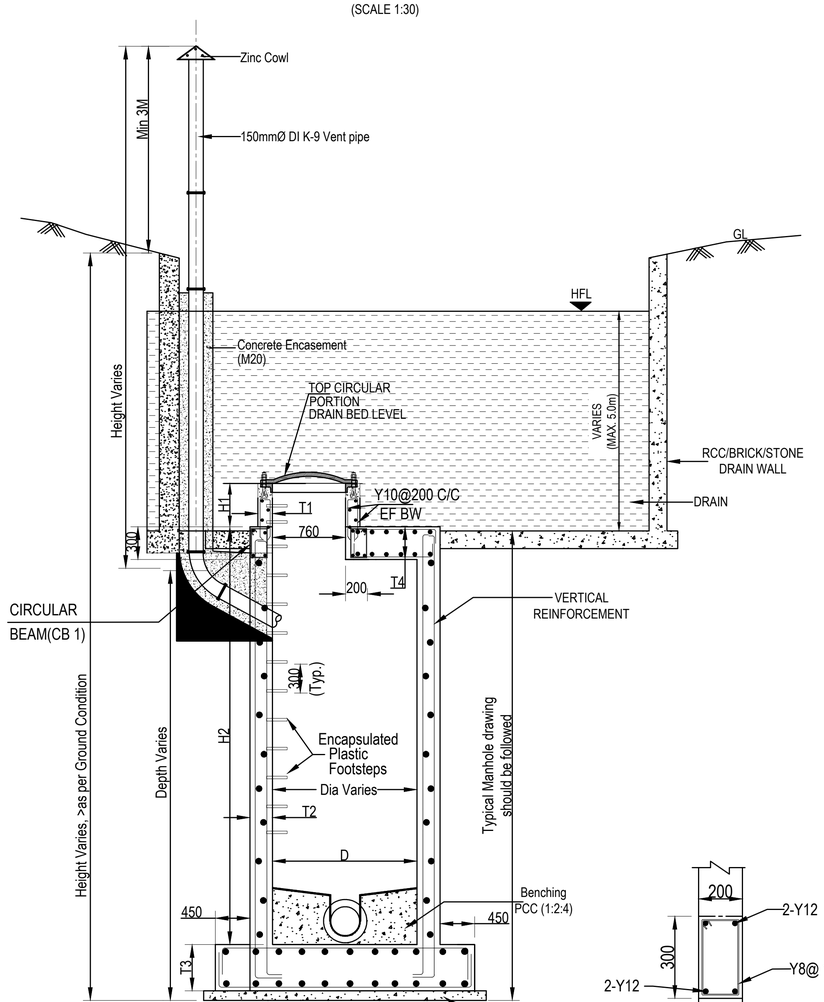
TITLE: STANDARD DETAILS OF R.C.C CAST IN-SITU MACHINE HOLE 1200MM,1500MM,1800MMDIA UPTO 3M DEPTH 1500MM,1800MMUPTO 6M DEPTH (TYPICAL) WITH VENTILATION SHAFT

DWG NO: TN-KWSDRP-WBS2B-CV-3036



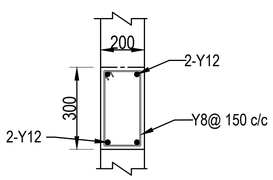
PLAN OF MAN HOLE INSIDE THE DRAIN (RCC)

(SCALE 1:30)



SECTIONAL DETAILS OF MANHOLE INSIDE THE DRAIN (RCC)

(SCALE 1:30)



CIRCULAR BEAM (CB 1)

VALID FOR 3 TO 6M BELOW DRAIN

TABLE - 1

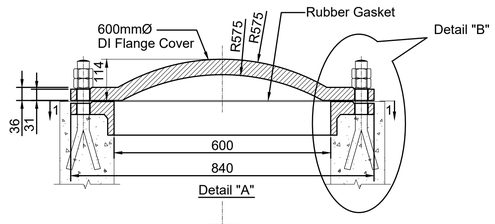
DIMENSION DETAILS OF MACHINE HOLE

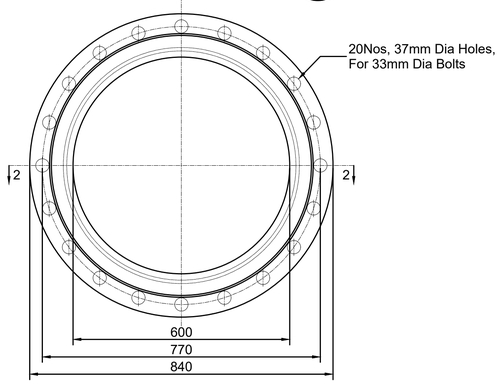
SL.No	(DIA OF MACHINE HOLE) in 'mm'	(Wall height) in 'mm'	(Wall thickness in 'mm'	(Wall thickness) in 'mm'	(Base Slab thickness) in 'mm'	(Roof Slab thickness) in 'mm'
	D	H2	T1	T2	T3	T4
1	1200	upto 3000	150	200	200	300
2	1500					
3	1800					
5	1500	3000 to 6000	150	300	300	300
6	1800					

TABLE - 2

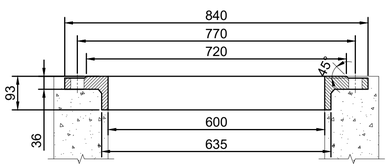
REINFORCEMENT DETAILS OF MACHINE HOLE

SL.No	(DIA OF MACHINE HOLE) in 'mm'	(Wall height) in 'mm'	Base Slab Reinforcement (a)	Wall Reinforcement			Roof Slab Reinforcement (a)
				Hoop Reinforcement (c)		Longitudinal Reinforcement (b)	
				upto half the height (h) from the bottom	Top half the height (h)		
	D	H2					
1	1200	upto 3000	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c
2	1500		Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c	Y10@200c/c
3	1800		Y12@200 c/c	Y12@200 c/c	Y12@200 c/c	Y12@200c/c	Y12@200 c/c
4	1500	3000 to 6000	Y12@150c/c	Y12@150c/c	Y12@150c/c	Y12@150c/c	T12@150c/c
5	1800		Y12@150c/c	Y12@150c/c	Y12@150c/c	Y12@150c/c	Y12@125c/c



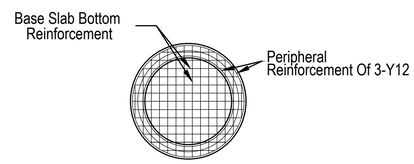


Section 1-1

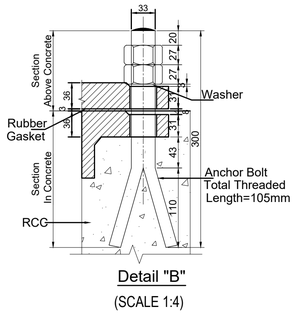


Section 2-2

(SCALE 1:5)

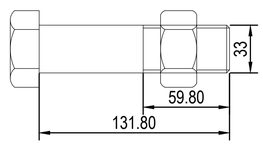


BASE SLAB-SECTIONAL BOTTOM PLAN



Detail "B"

(SCALE 1:4)



Bolt Details

(SCALE 1:2)

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED FROM THE DRAWING.
3. ALL DRAWINGS ARE INTERRELATED AND SHALL BE READ IN CONJUNCTION WITH ONE ANOTHER.
4. GRADE OF CONCRETE MIX SHALL BE M30 CONFIRMING TO I.S 456–2000.
5. ONLY SULPHATE RESISTING CEMENT CONFIRMING TO IS:12330:1988 SHALL BE USED FOR ALL CONCRETING WORKS.
6. ALL REINFORCEMENT BARS SHALL BE HYSD CRS BARS OF GRADE Fe 500 CONFIRMING TO IS:1786.
7. ANY CHANGE IN SBC OF SOIL LESS THAN 12 TON THE DESIGN OF FOUNDATION SHALL BE REVISED AS PER ACTUAL SBC.
8. TOP OF MACHINE HOLE COVER SHALL BE FLUSH WITH FINISHED ROAD LEVEL AND AS DIRECTED BY ENGINEER.
9. IF THE SEWER ROUTE IS PARALLEL TO NALLA/DRAIN/LAKE THEN THE TOP OF MACHINE HOLES SHOULD BE ATLEAST 0.2 m ABOVE THE HFL OF THE NALLA/DRAIN/LAKE OR AS DIRECTED BY THE ENGINEER.
10. WHEREVER THE SEWER ROUTE IS INSIDE THE NALLA, DRAIN BED LEVEL SHALL BE TAKEN FOR THE DESIGN AND THE DEPTH OF MH SHALL BE AS DIRECTED BY THE ENGINEER.
11. H1 IS 1500MM FOR MACHINE HOLE HEIGHT UP TO 3000 MM AND 3000 MM FOR MACHINE HOLE HEIGHT FROM 3000 MM TO 10000 MM OR AS PER SITE CONDTION.
12. PROVISION FOR INCOMING SEWERS, HOUSE SERVICE CONNECTIONS IF ANY SHALL BE PROVIDED.
13. Y DENOTES HYSD BARS
14. 3mm PVC ENCAPSULATE ON 12mm BAR, FOOT STEPS Fe 500
15. PROVISION FOR DROP (FOR DROP ARRANGEMENT) IN MH's SHALL BE PROVIDED AS PER SITE REQUIREMENT AND AS DIRECTED
16. IN CASE OF MACHINE HOLES IN DRAIN/NALLAH, FIXING OF THE TOP OF THE COVER SHALL BE WITH REINFORCEMENT RODS ANCHORD WITH HOOKS ON THE WALLS FOR PROTECTING AGAINST UPLIFT/LIFTING OF THE COVER
17. ADDITIONAL REINFORCEMENT AS PER APPROVED DRAWINGS IN AND ALLROUND PIPE OPENINGS SHALL BE PROVIDED
18. INTERCONNECTION WITH INCOMING & OUTGOING SEWERS INCLUDING FIXING THEM WITH RCC M30 GRADE CONCRETE
19. IN CASE OF CAST IN–SITU MACHINE HOLE TO BE CONSTRUCTED IN ROAD, MACHINE HOLE SHALL BE CONSTRUCTED WITHOUT TOP CIRCULAR PORTION.
20. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.
21. GAP TO MATCH FORMWORK AT SITE (50–75mm).
22. VENTILATING SHAFT WILL BE PROVIDED AS PER SITE CONDITION & AS DIRECTED BY ENGINEER.
23. VERTICAL SHAFT CAN BE INSIDE/OUTSIDE THE SWD DEPENDS ON SITE CONDITION & UPON APPROVAL OF ENGINEER.

LEGEND:

FGL	FINISHED GROUND LEVEL
RL	REDUCED LEVEL
LVL	LEVEL
THK	THICKNESS
TYP	TYPICAL
BW	BOTH WAYS
BF	BOTH FACES
RF/REINF	REINFORCEMENT
DIA	DIAMETER
NTS	NOT TO SCALE
CB	CIRCULAR BEAM
RCC	REINFORCED CEMENT CONCRETE
MAX	MAXIMUM
DI	DUCTILE IRON
ADDL	ADDITIONAL
PCC	PLAIN CEMENT CONCRETE
C/C	CENTER-TO-CENTER
HFL	HIGH FLOOD LEVEL
MIN	MINIMUM
M/S	MILD STEEL

ISSUE	DATE	DESCRIPTION	BY	CHECKED	APPD.
P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	- -

FOR TENDER PURPOSE ONLY

BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

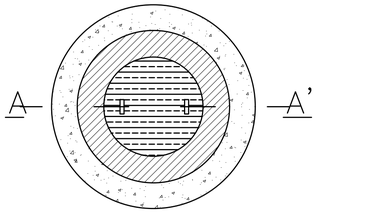
TITLE: STANDARD DETAILS OF R.C.C CAST IN-SITU MACHINE HOLE 1200mm,1500mm,1800mmDIA UPTO 3m DEPTH 1500mm,1800mmUPTO 6m DEPTH (TYPICAL) WITH VENTILATION SHAFT

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

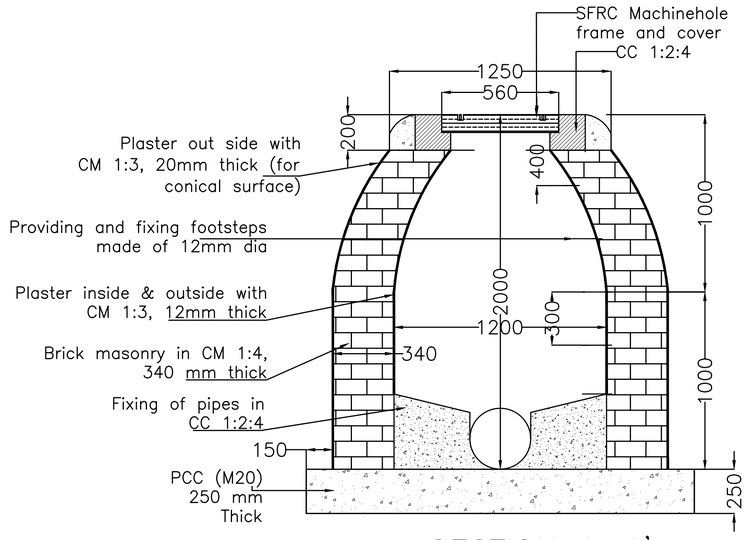
DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE: (CURRENT ISSUE) 02/04/2025
CHECKED: BMS		DIVISION: CV
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3036	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3036.dwg		A1 SIZE

TITLE: PLAN & SECTION OF BRICK MASONRY MACHINE HOLE FOR 1.2 M DIA, 2M & 6M DEPTH

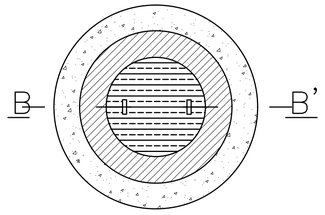
DWG NO: TN-KWSDRP-WBS2B-CV-3037



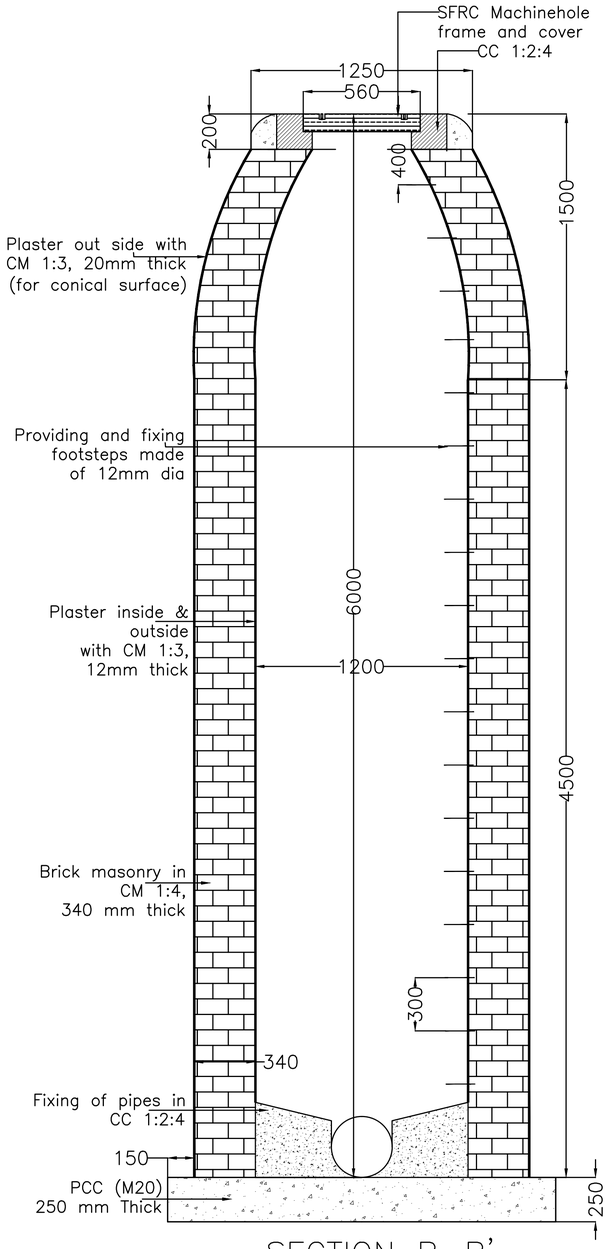
PLAN



SECTION A–A'



PLAN



SECTION B–B'

NOTES:

1. **All levels are in MM, Unless Other Wise Mentioned.**
2. **All Levels Are With Reference To The Gts Bench Mark Engraved On Centre Of 2nd Stones** On East Side Of Queen Victoria's Statue In Cubbon Park, Bangalore. Its Value Is 912.266m.
3. All the Co–ordinates are based on UTM WGS–84.

DRAWING / DOCUMENT REVIEW STATUS

Date of Receipt .....

A. Approved, manufacture / construction may commence.
B. Acceptable subject to changes indicated, resubmit for approval but manufacture/ construction may commence.
C. Amend as per the comments indicated and resubmit for approval.
D. Comments noted in letter/memo attached to forwarding transmittal Nr..... dated ..... Amend as comments indicated resubmit for approval.
E. Amend as comments indicated resubmit for record.
F. Comments noted in letter/memo attached to forwarding transmittal Nr. ..... dated..... Amend as comments indicated resubmit for record.
G. Drawing of this category is for information and hence not required to be approved.
H. Returned without review.

Approval of drawings / documents does not absolve Contractor / Vendor from any responsibilities for their accuracy or for the design, performance and safety of the Plant / Works or any other obligations under the contract and Indian Statutory Laws nor does it limit the Employer?s right under the contract.

LEGEND:

CM	CEMENT MOTAR
SFRC	STEEL FIBER REINFORCED CONCRETE
CC	CEMENT CONCRETE
PCC	PLAIN CEMENT CONCRETE

ISSUE	DATE	DESCRIPTION	BY	CHECKED	APPD.
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			CIVIL	-	-

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BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

TITLE: PLAN & SECTION OF BRICK MASONRY MACHINE HOLE FOR 1.2 m DIA, 2m & 6m DEPTH

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
DRAWN: SGS		DATE:(CURRENT ISSUE) 02/04/2025
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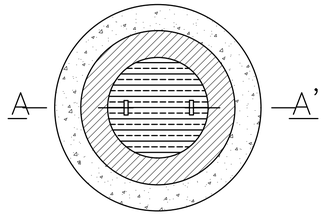
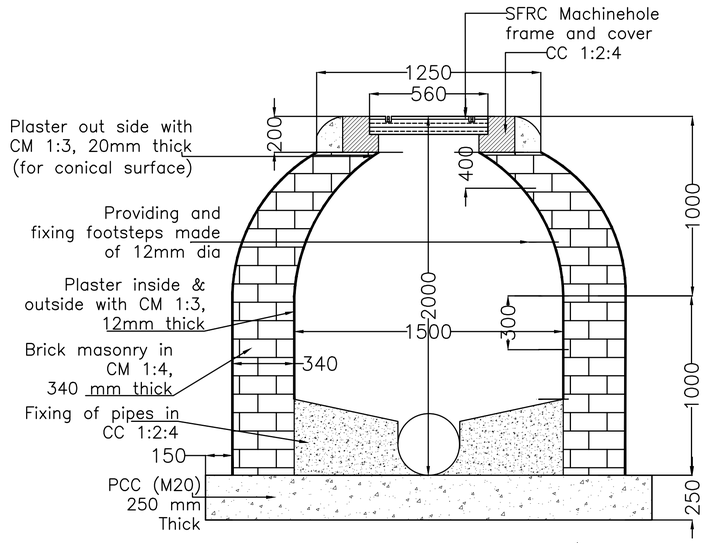
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3037	ISSUE: P0
FILE NAME: TN–KWSDRP–WBS2B–CV–3037.dwg		A1 SIZE

TITLE: PLAN & SECTION OF BRICK MASONRY MACHINE HOLE FOR 1.5 M DIA, 2M & 6M DEPTH

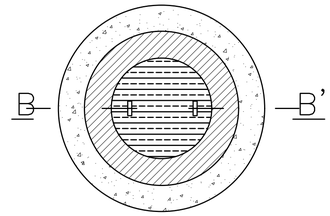
DWG NO: TN-KWSDRP-WBS2B-CV-3038



PLAN



SECTION A–A'



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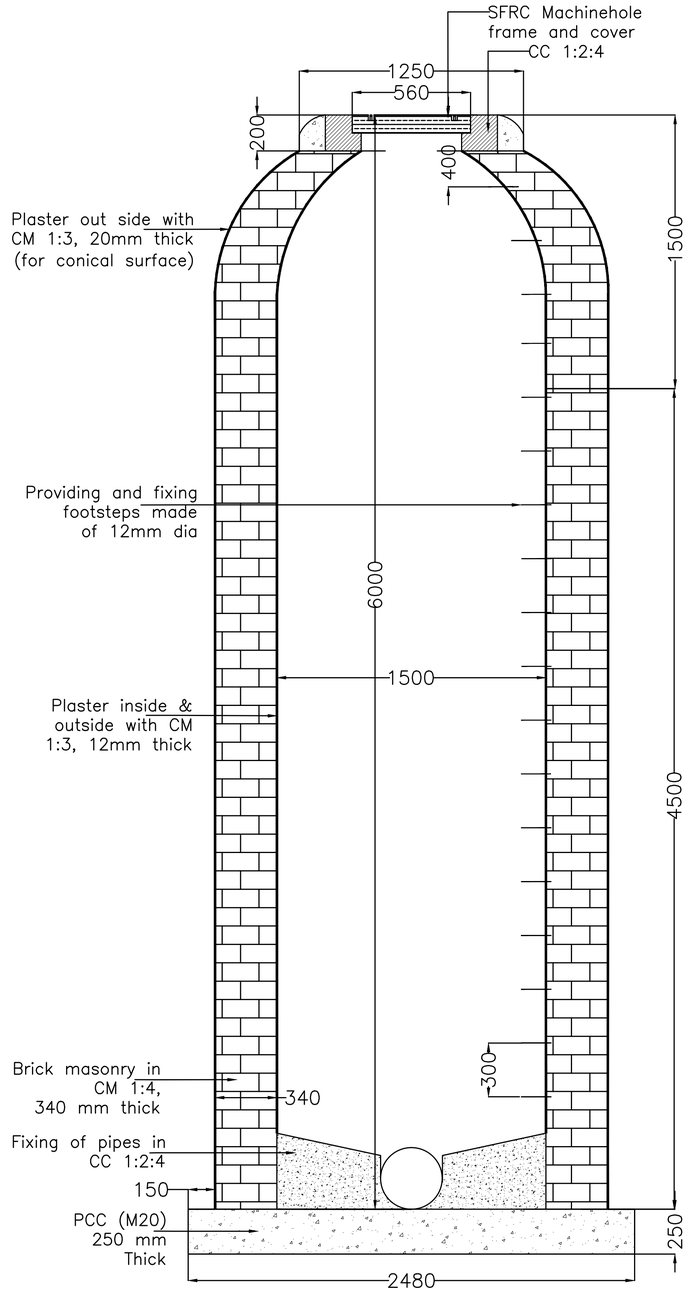

SECTION B–B'

NOTES:

1. **All levels are in MM, Unless Other Wise Mentioned.**
2. **All Levels Are With Reference To The Gts Bench Mark Engraved On Centre Of 2nd Stones** On East Side Of Queen Victoria's Statue In Cubbon Park, Bangalore. Its Value Is 912.266m.
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BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

TITLE: PLAN & SECTION OF BRICK MASONRY MACHINE HOLE FOR 1.5 m DIA, 2m & 6m DEPTH

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
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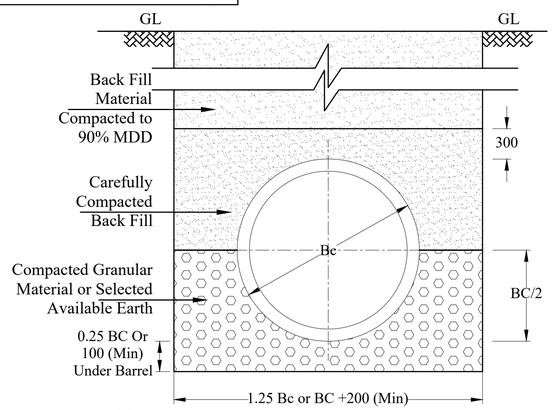
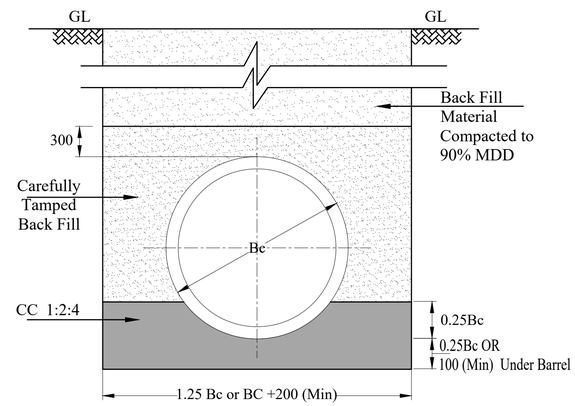
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3038	ISSUE: P0
FILE NAME: TN–KWSDRP–WBS2B–CV–3038.dwg		A1 SIZE

TITLE: TYPICAL DRAWING OF PIPE BEDDING/ENCASING

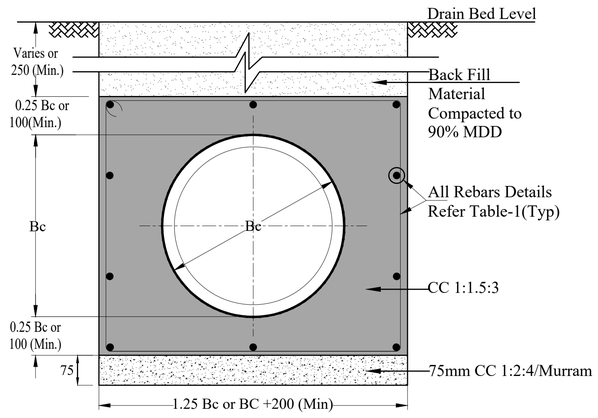
DWG NO: TN-KWSDRP-WBS2B-CV-3039



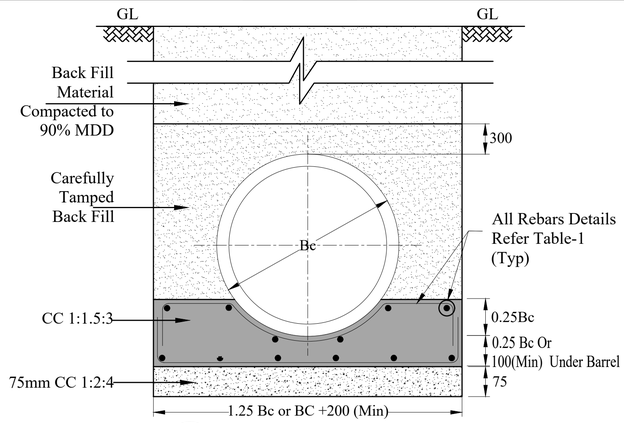
1 COMPACTED GRANULAR BEDDING(GRB) CLASS-B



2 PLAIN CONCRETE CRADLE BEDDING/BEDDING UNDER LINED DRAIN CLASS-Ab



3 BEDDING / ENCASING/UNDER UNLINED DRAIN CLASS-Ae



4 RCC CRADLE BEDDING CLASS-Ac

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. CONCRETE GRADE SHALL BE AS PER BOQ PROVISIONS.
3. STEEL FOR REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE FE500 CONFORMING TO IS-1786.
4. REINFORCEMENT WHERE SPLICED SHALL HAVE A MINIMUM LAP OF 50 X BAR DIAMETER. LAPS SHALL BE STAGGERED.
5. CLEAR COVER TO REINFORCEMENT BEDDING SHALL BE 50MM.
6. THE FIGURE SHOWS TYPICAL ARRANGEMENT OF REINFORCEMENT FOR EXACT DETAILS REFER TABLE 1.
7. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.
8. IN MAJOR ROADS AND ROAD CROSSINGS,TRENCH FILLING WITH QUARRY DUST CAN BE ADOPTED AND SHALL BE AS PER SITE REQUIREMENT OR AS DIRECTED BY ENGINEER.
9. THE THICKNESS OF QUARRY DUST SHALL NOT EXCEED 1m BELOW THE ROAD SURFACE.

ABBREVIATIONS

1. GL - GROUND LEVEL
2. Thk - THICK
3. Min - MINIMUM
4. Typ - TYPICAL
5. Bc - BARREL OUTER DIAMETER
6. C/C - CENTER TO CENTER
7. RCC - REINFORCED CEMENT CONCRETE
8. PCC - PLAIN CEMENT CONCRETE
9. MDD - MAXIMUM DRY DENSITY
10. WMM - WET MIX MACADAM
11. SWD - STORM WATER DRAIN
12. FRL - FINISHED ROAD LEVEL
13. GSB - GRANULAR SUB BASE
14. GRB -GRANULAR BEDDING

TABLE -1: REINFORCEMENT DETAILS FOR BEDDING/ENCASING

Barrel Internal Dia	Barrel Outer Dia (Bc)	CLASS - Ac			CLASS - Ae			
		Dia of rods	Top bars (Both Ways)	Bottom bars (BothWays)	Dia of rods	Top bars (Both Ways)	Bottom bars (BothWays)	Side Bars
			Spacing	Spacing		Spacing	Spacing	Spacing
300	380	10	200	150	10	250	250	250
350	500	10	200	150	10	250	250	250
400	550	10	200	150	10	250	250	250
450	600	10	200	150	10	250	250	250
500	650	10	200	150	10	250	250	250
600	770	10	200	150	10	250	250	250
700	870	10	200	150	10	250	250	250
800	990	10	200	150	10	250	250	250
900	1100	10	150	150	10	250	250	250
1000	1230	10	150	150	10	250	250	250
1100	1330	10	150	150	12	250	250	250
1200	1440	10	150	150	12	250	250	250
1400	1670	10	150	150	12	250	250	250

SL.NO.	TYPE OF BEDDING/ENCASING	APPLICATION CONDITIONS
1.	CLASS B	In firm, hard or dense soil/rocky strata for depths up to 6m cover.
2.	CLASS Ab	To be provided in loose soil, with depth of cover between 1m and 6m.(not to be adopted on hard or dense soil)
3.	CLASS Ae	1.For drain and road crossings 2.For sewer pipes laid in drains/nallah where cover over pipe is less than 1m
4.	CLASS Ac	1.For sewer pipes laid where cover over pipe is more than 6m/As per site conditions. 2.For sewer pipes laid along or across lake beds.

ISSUE	DATE	DESCRIPTION	BY	CHECKED
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BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

TITLE: TYPICAL DRAWING OF PIPE BEDDING/ENCASING

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

DESIGNED: MKV	APPROVED	DATE: (TO ISSUE) 02/04/2025
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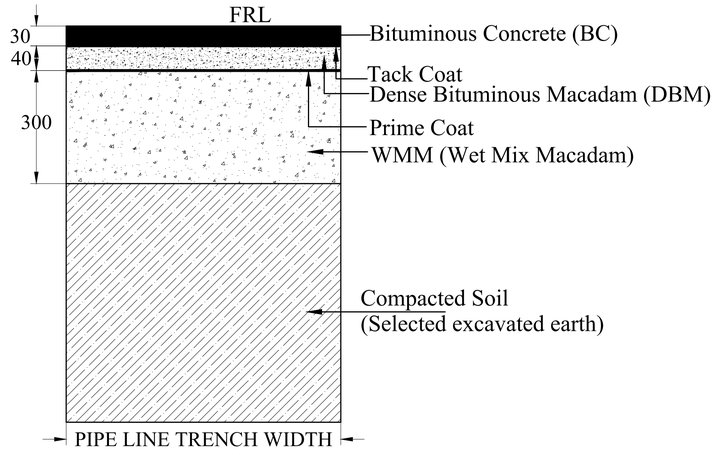
SCALE: NTS	DWG. NO. TN-KWSDRP-WBS2B-CV-3039	ISSUE: P0
FILE NAME: TN-KWSDRP-WBS2B-CV-3039.dwg		A1 SIZE

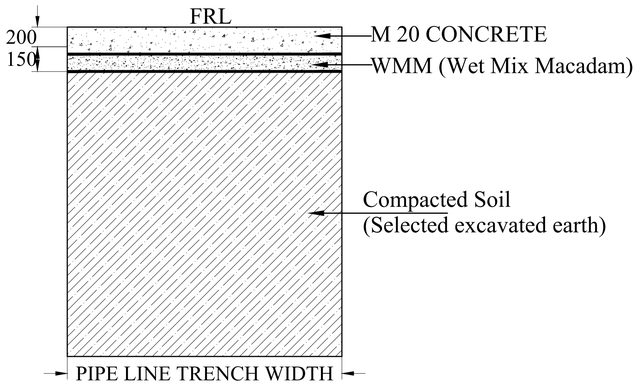
TITLE: TYPICAL CROSS SECTIONS FOR RESTORATION OF ASPHALT & CONCRETE ROADS

DWG NO: TN-KWSDRP-WBS2B-CV-3040

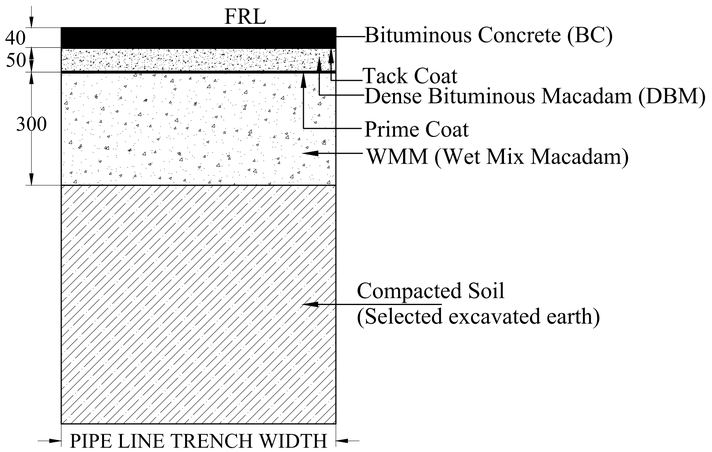


TYPICAL CROSS SECTION OF ASPHALT ROAD RESTORATION

(FOR ROAD WIDTH LESS THAN 40FT.)



TYPICAL CROSS SECTION OF CONCRETE ROAD



TYPICAL CROSS SECTION OF ASPHALT ROAD RESTORATION

(FOR ROAD WIDTH MORE THAN 40FT.)

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. CONCRETE GRADE SHALL BE AS PER BOQ PROVISIONS.
3. THE WORK SHALL BE DONE AS PER BOQ, SPECIFICATIONS AND CONTRACT PROVISIONS.

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P0	02/04/2025	FOR TENDER PURPOSE	SGS	MKV	–
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BANGALORE WATER SUPPLY AND SEWERAGE BOARD
KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAMME (KWSDRP) FUNDED BY WORLD BANK

PROCUREMENT, CONSTRUCTION AND COMMISSIONING OF RISING MAIN, MAIN SEWERS AND LATERALS INCLUDING MACHINE HOLES FOR BYATARAYANAPURA ZONE (ITEM RATE) IN 110 VILLAGE AREAS (PHASE II) UNDER KARNATAKA WATER SECURITY AND DISASTER RESILIENCE PROGRAM (KWSDRP) - (CONTRACT PACKAGE NO. BWSSB CE-P/KWSDRP/WBS-2-B)

TITLE: TYPICAL CROSS SECTIONS FOR RESTORATION OF ASPHALT & CONCRETE ROADS

PROJECT MANAGEMENT CONSULTANTS:
TATA CONSULTING ENGINEERS LTD
NJS ENGINEERS INDIA PVT. LTD(JV)

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